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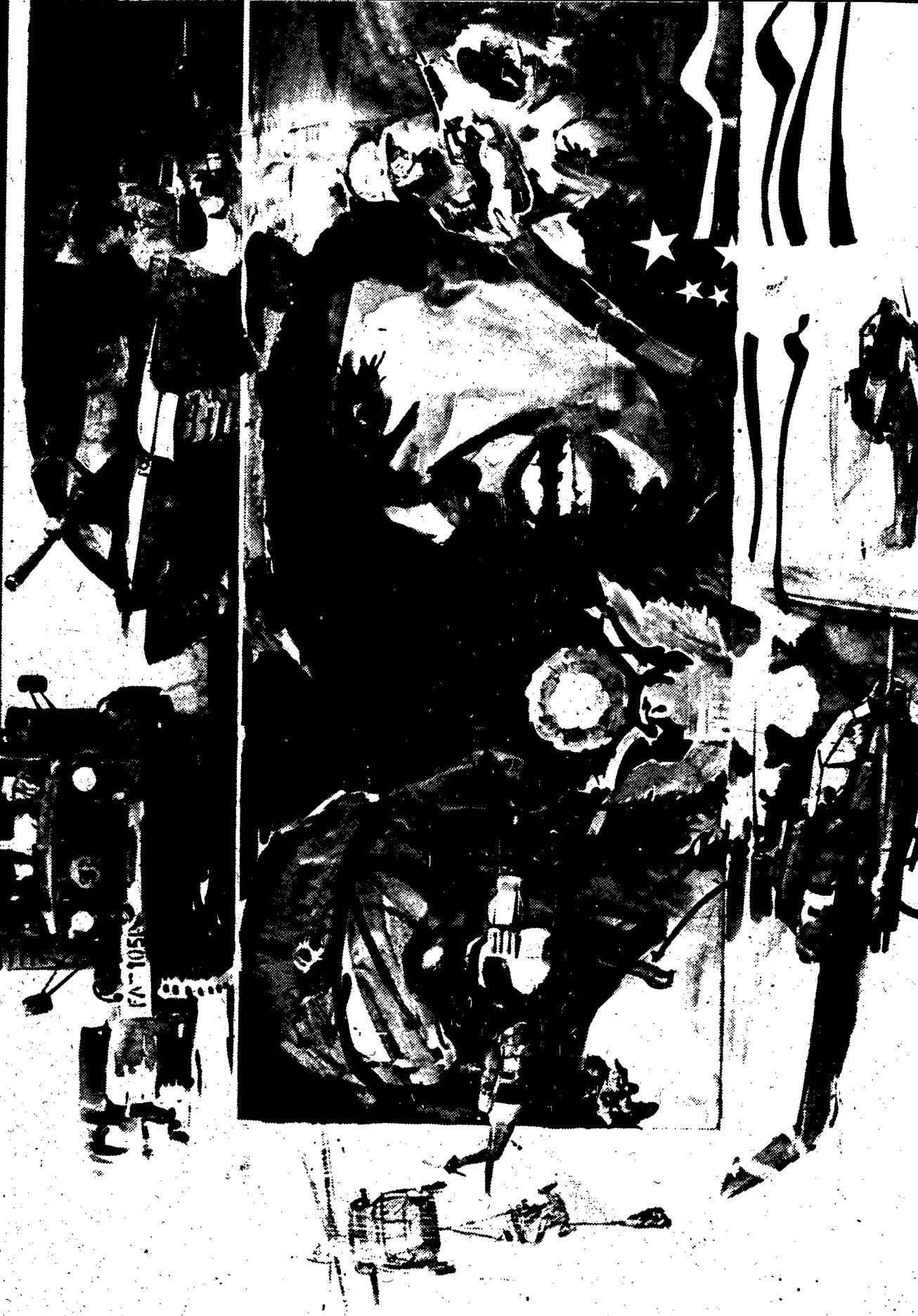
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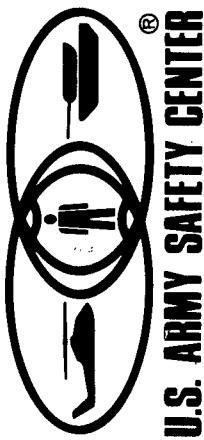
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**Management by Objective
Review of Army Accident
Experience FY 84**

Prepared by



U.S. ARMY SAFETY CENTER[®]

Preface

The number and frequency of occurrences coupled with costs serves as the primary basis for problem identification, the identification of trends, and the development of countermeasures. Statistics reflect Army-wide data to include the Corps of Engineers, Army National Guard, and Army Reserve. Rates shown are in compliance with DODI 6055.7.

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SAFETY

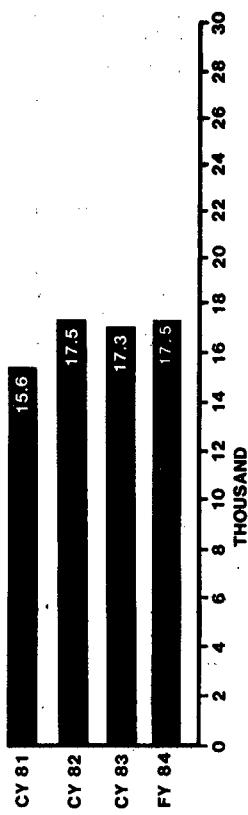
PROGRAM OBJECTIVES AND GOALS FY 84

- Reduce the incidence of work place injuries and illnesses resulting in new compensation claims by 3% as compared to CY 82.
This objective was not achieved. Incidences of work place injuries and illnesses resulting in new compensation claims increased by 3.3% in FY 84.
- Reduce the number of fatal and disabling injuries to military personnel by 3% as compared to CY 82.
This objective was achieved. Military fatalities and disabling injuries decreased by 6.6% in FY 84.
- Reduce the number of Class A, B, and C aviation mishaps by 5% as compared to CY 82.
This objective was achieved. Army Class A, B, and C aviation mishaps were reduced by 19%. Class A aviation mishaps decreased by 9%.
- Establish an explosive safety training course to provide instruction in safe operating procedures/standards for operational activities.
This objective was achieved. An Explosive Safety Course (ESC) was developed by the USASC in FY 84. The first course was presented to users and safety personnel in 8th US Army in Korea in FY 84. Four ESC are scheduled for FY 85.
- Revise AR 600-55, Driver Selection, Testing and Licensing to provide standardized formal driver training to all Army drivers.
This objective was not achieved. Revised AR 600-55 was coordinated by Army MACOM and forwarded to the ARSTAF in Jan 85 for coordination.
- Develop countermeasures emphasizing specific controls for problem areas related to injuries resulting from personnel injuries - other accidents.
This objective was 90% achieved due to the many and varied personnel injuries - other type accidents.

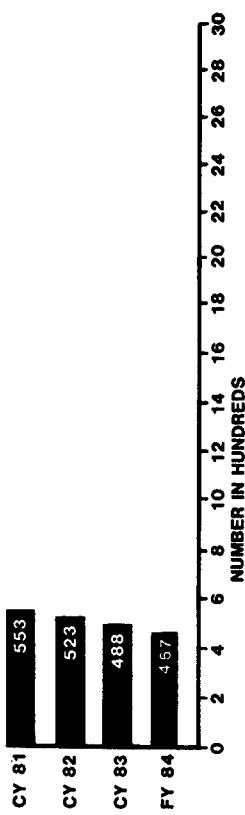
TOTAL U.S. ARMY ACCIDENT EXPERIENCE

(Includes Civilian & On/Off-Duty Military)

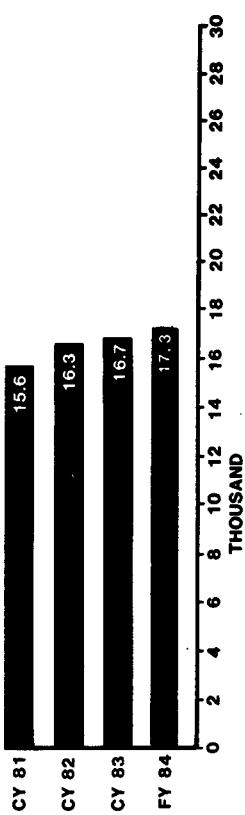
ACCIDENTS



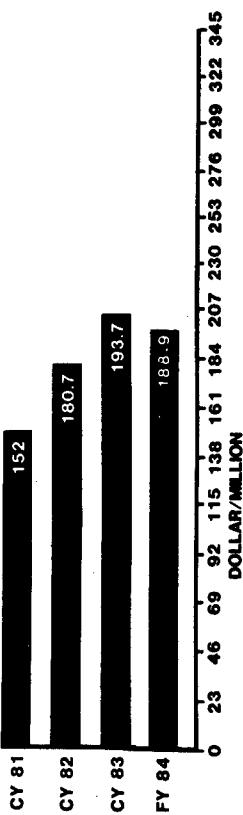
FATALITIES



NON-FATAL INJURIES



TOTAL COST



Accidents increased by 1.2% (206 accidents) in FY 84 compared to CY 83. Increases in combat vehicle and other Army vehicle (forklifts, etc.) accidents, fires, and other personnel injury accidents offset a decrease in aviation mishaps.

The downward trend in fatalities over the previous three years continued in FY 84. Decreases in military fatalities in off-duty Personnel Injury-other, AMV, combat vehicle, aviation, and explosive accidents account for the major portion of the decrease in FY 84.

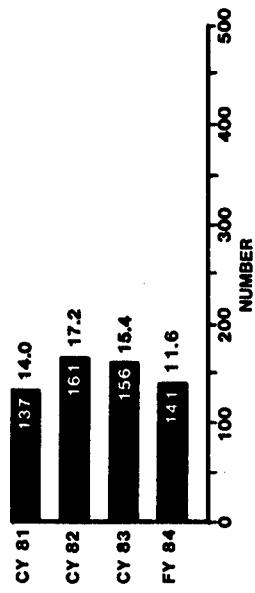
Nonfatal injuries continue to increase. During FY 84 a 4 percent (+605 injuries) increase occurred compared to CY 83.

The total cost of FY 84 accidents decreased by \$4.8 million primarily as a result of a decrease in injury cost associated with personnel injury-other accidents.

U.S. ARMY MILITARY INJURIES

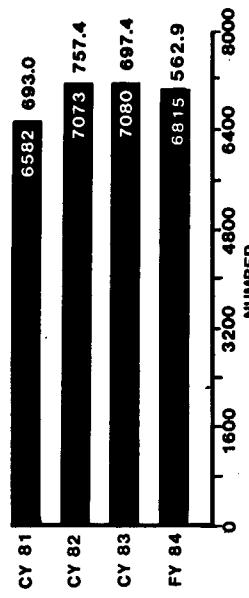
On Duty

FATALITIES



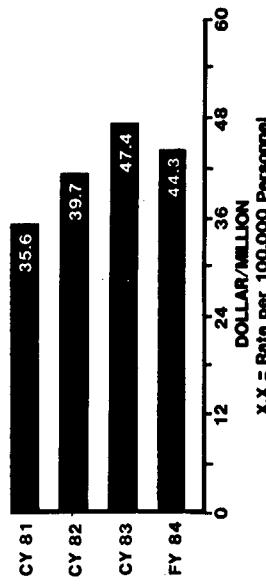
On-duty military fatalities decreased 10% (-15) in FY 84 compared to CY 83. Decreases occurred in AMV, combat vehicle, explosive, and aviation accidents. This is the second consecutive year on-duty military fatalities have decreased.

NON-FATAL INJURIES



The upward trend in on-duty non-fatal military injuries was not evident in FY 84. A 4% decrease (-265) occurred in FY 84 compared to CY 83. The greatest decreases occurred in personnel injury-other and explosive accidents which offset increases in on-duty non-fatal military injuries in combat vehicle accidents and fires.

INJURY COST

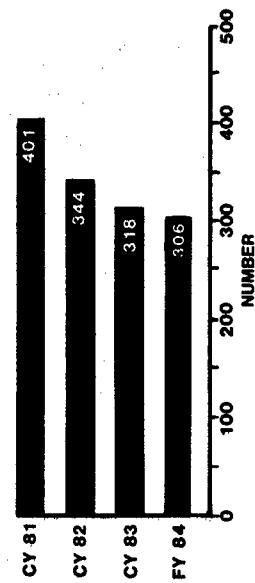


X.X = Rate per 100,000 Personnel

U.S. ARMY MILITARY INJURIES

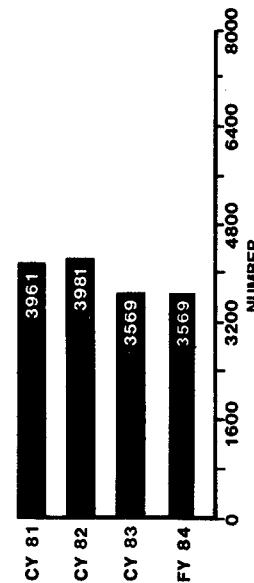
Off Duty

FATALITIES



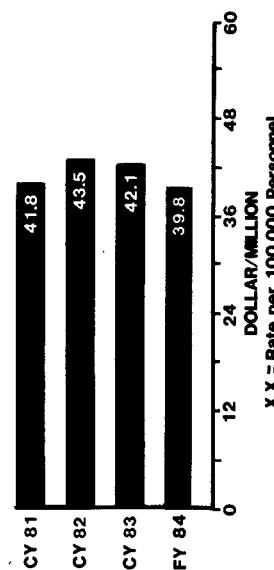
The downward trend in off-duty military fatalities continued in FY 84. Four percent fewer (-12 fatalities) occurred in FY 84 compared to CY 83. The largest decrease occurred in personnel injury-other accidents, offsetting an increase in POV fatalities.

NON-FATAL INJURIES



The number of off-duty non-fatal injuries to military personnel during FY 84 was the same as during CY 83. However, a noteworthy decrease occurred in POV accidents, offsetting increases in non-fatal injuries resulting from personnel injury-other, radiation, AMV accidents, and fires.

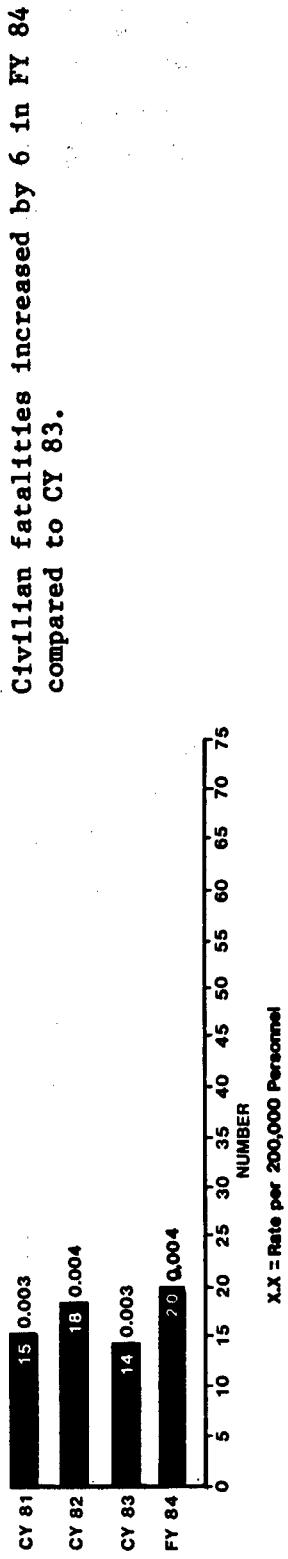
INJURY COST



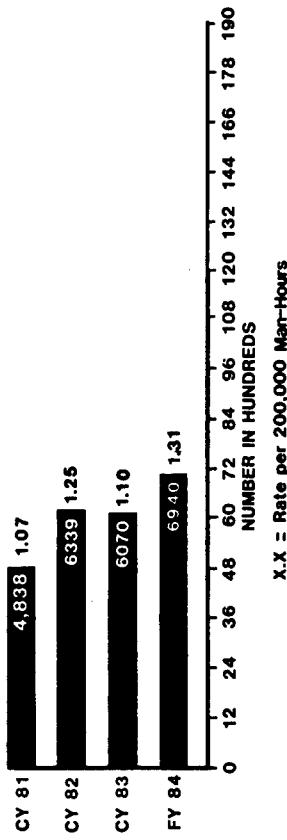
The decrease in fatalities, coupled with the stabilization of non-fatal injuries in FY 84, resulted in \$2.3 million less in off-duty non-fatal military injury costs, a 5% reduction.

U.S. ARMY ON-DUTY CIVILIAN INJURIES

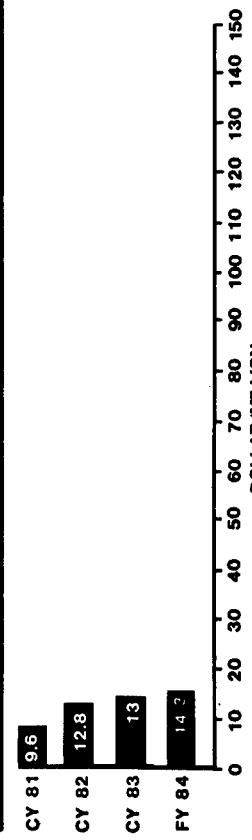
FATALITIES



NON-FATAL INJURIES



CIVILIAN INJURY COST



Civilian fatalities increased by 6 in FY 84 compared to CY 83.

Civilian nonfatal injuries increased by 14 percent (+870 injuries) in FY 84 compared to CY 83. The major portion of this increase resulted from an increase in the number of injuries in personnel injury-other accidents.

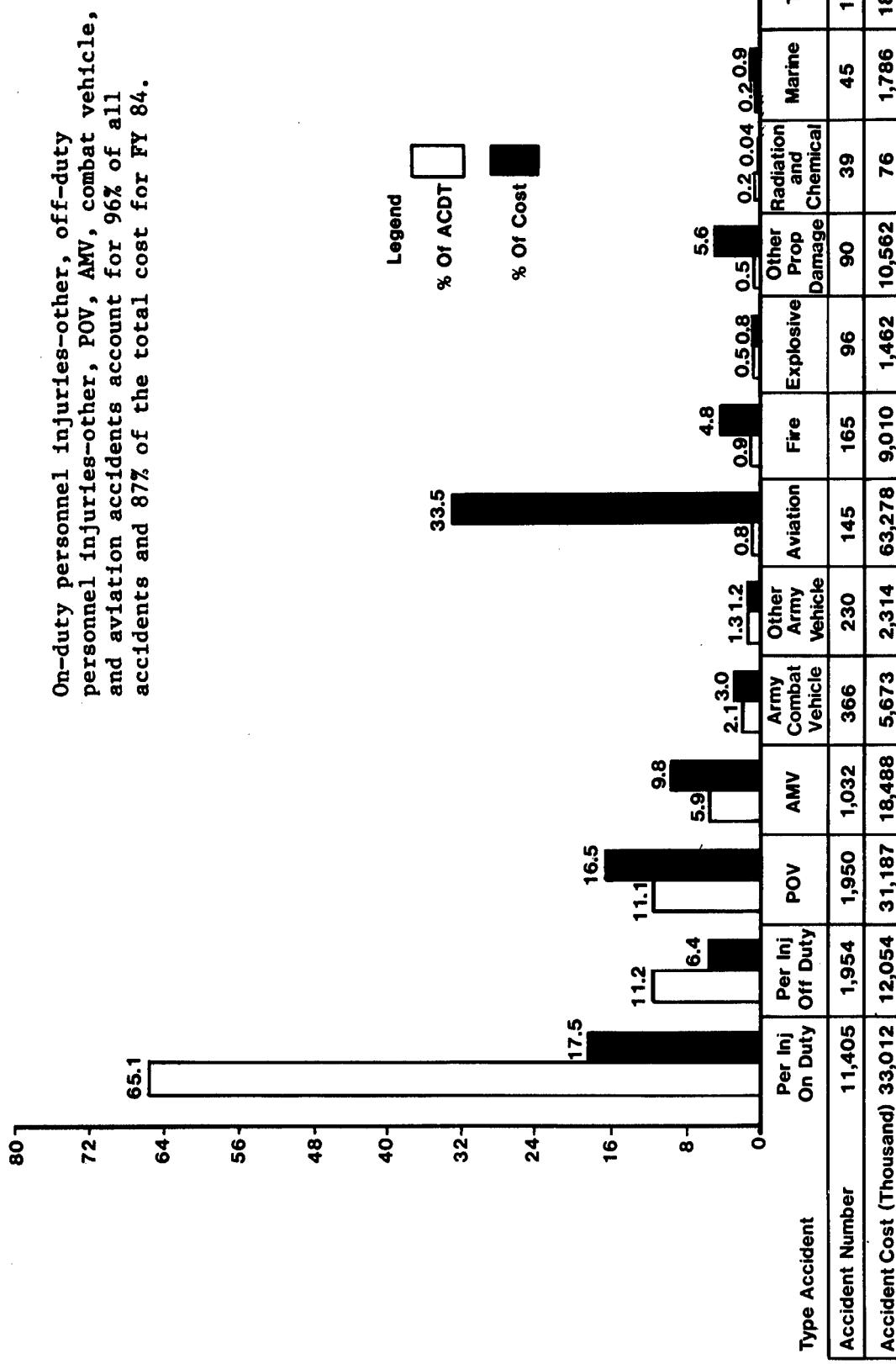
As a result of the increase in civilian injuries, the total civilian injury cost increased by \$1.3 million.

ANALYSIS

The analysis which follows is based on DA Forms 285, 285-1, and 2397 (series) accident and aircraft mishap reports for both military and civilian personnel.

FREQUENCY, PERCENT AND COST OF ACCIDENTS

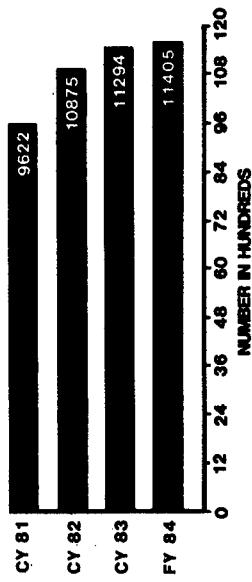
Fiscal Year 1984



PERSONNEL INJURY-OTHER ACCIDENTS

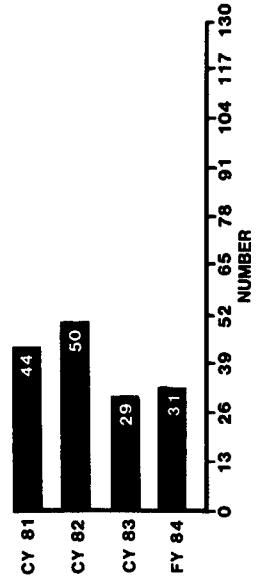
On Duty

ACCIDENTS



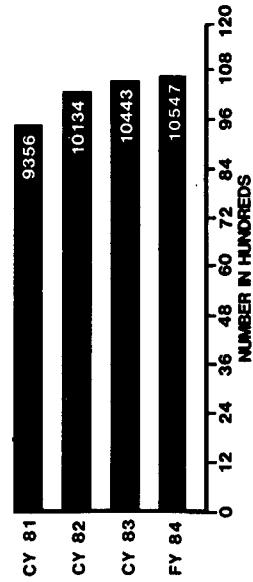
The rising trend in on-duty military and civilian personnel injury-other accidents continued in FY 84 with a 1% increase (111 accidents) over CY 83.

FATALITIES



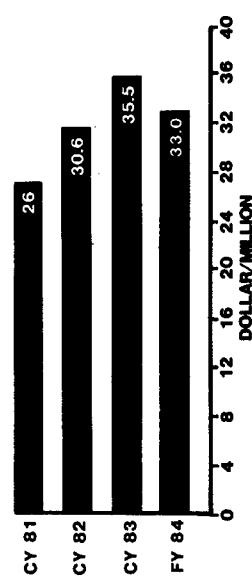
The number of on-duty personnel injury-other fatalities remained low for the second consecutive year compared to previous years. During FY 84 the number of fatalities increased by 2 over CY 83. Combat soldiering activities accounted for 42% (11 fatalities) of the military fatalities, while maintenance, repair, and servicing activities accounted for 60% (3 fatalities) of the civilian fatalities.

NON-FATAL INJURIES



The rising trend in on-duty personnel injury-other non-fatal injuries continued in FY 84 with a 1% increase (104 injuries) over CY 83. This is attributed to increase in civilian injuries involving materiel handling, office work, security/law enforcement, human locomotion, and with being a passenger.

TOTAL COST



Because of fewer on-duty non-fatal military injuries and less severe injuries to both military and civilian personnel in on-duty personnel injury-other accidents the resulting cost of these accidents decreased by 7% (\$2.5 million).

ON-DUTY PERSONNEL INJURIES FY 84

Activity	Military	Civilian
Maintenance/repair/servicing	612	1,555
Handling materiel/passengers	568	1,433
Human locomotion	520	946
Combat soldiering	1,221	---
Physical training	580	11
Being a passenger	258	187
Sports	332	32
Janitorial/housekeeping/grounds	40	266
Food/drink preparations	89	197
Office activities	22	229
Miscellaneous (22 other activities)	<u>908</u>	<u>551</u>
Total	5,150	5,407
SUBTOTAL	10,557	31
Activity Unreported	21	NON-FATAL INJURIES
TOTAL	10,578	10,547
		FATALITIES
		31
		NON-FATAL INJURIES
		10,547
		TOTAL
		10,578

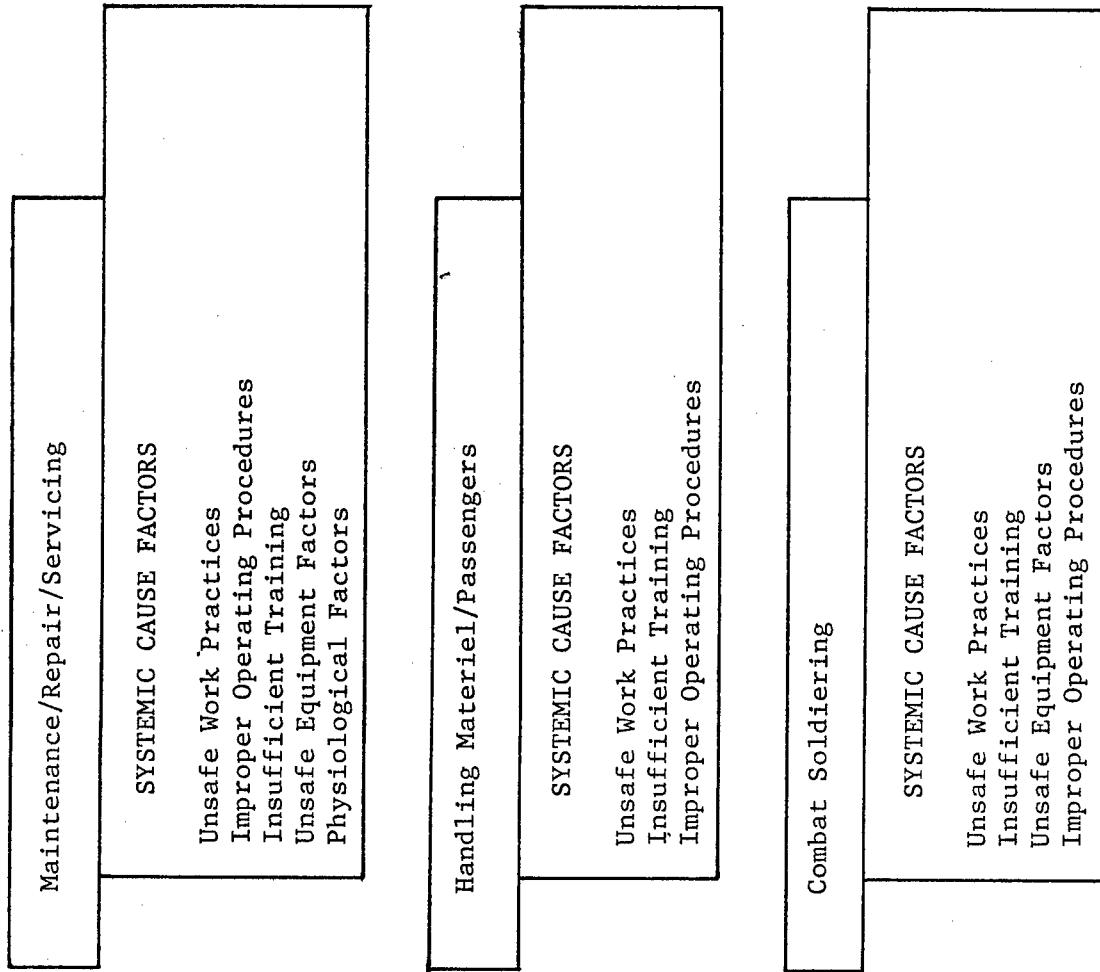
PROBLEM AREAS

Civilian injuries accounted for 51% of the on-duty personnel injuries. Military on-duty injuries accounted for the remaining 49%.

Looking at the top three activities:

- a. Maintenance/repair/servicing was the number two activity for military and number one for civilians. Most of these injuries occurred in maintenance facilities, with vehicle fatalities being the most prevalent. The most frequent task involved was installing/removing/modifying equipment.
- b. Handling materiel/passengers was the number four activity for military and number two for civilians. Most of the military injuries occurred in training areas, operational facilities, and maintenance facilities. Most of the civilian injuries occurred in storage facilities, maintenance facilities, and operational facilities. The most frequent tasks involved for both military and civilian were transporting/moving and loading/unloading.
- c. Combat soldiering was the number one activity for military personnel. Most of these injuries occurred in designated training areas. The most frequent task involved was tactical parachuting.

PERSONNEL INJURY – ON-DUTY



PROBLEM AREA: Maintenance/Repair/Servicing

PRINCIPAL CAUSE FACTOR: Unsafe work practices (i.e., errors due to inadequate self-discipline and inadequate supervision) represent 76% of the maintenance/repair/servicing problem. The following are the top two unsafe work practices among those identified for the reporting period.

- a. Misuse of equipment or failure to use required equipment.
- b. Improper body position.

COUNTERMEASURES:

USASC published articles in Countermeasure dealing with Back Injuries (Jan 84), Stones in Gear Box (Jan 84), On-Duty Fatalities (Mar 84), Backing Accidents (Apr 84), Knee Injuries (May 84), Goer Engine Stoppage (Jun 84), Back Injuries (Jun 84), Maintenance Hammer Injuries (Sep 84), Maintenance Accident Briefs (Oct 84), Speeding (Nov 84), Maintenance (Nov 84), Eye Injuries (Dec 84), Battery Hazards (Dec 84).

USASC developed a Safe Lifting Technical Bulletin (TB) which has been sent to HQDA for publication. The TB provides basic safe lifting guidance for supervisors and individuals throughout the Army.

USASC developed a Back Injury Emphasis Program for Firefighters. This item complements the Safe Lifting TB by focusing on high-risk groups, in this case firefighters. TRADOC is currently evaluating the initial test program for firefighters with an evaluation expected in Jun 85. If effective, other high-risk groups will be targeted.

USASC incorporated shop and flightline safety and OSHA compliance into curriculum of accident prevention courses being taught by USASC.

USASC has completed the first draft of a report on maintenance accidents in wheeled and tracked vehicle facilities (Technical Report 85-1).

PRINCIPAL CAUSE FACTOR: Improper operating procedures (i.e., errors due to inadequate Technical Manuals (TM) and Standing Operating Procedures (SOP)) represent 9% of the maintenance/repair/servicing problem.

COUNTERMEASURES:

USASC published articles in Countermeasure dealing with the subject matter.

AMC revised procedures and manuals which advocate only one person as capable to change tires on 2½- and 5-ton trucks.

PRINCIPAL CAUSE FACTOR: Insufficient training (i.e., errors due to inadequate training, on-the-job training, and inadequate experience) represents 5% of the maintenance/repair/servicing problem.

COUNTERMEASURES:

USASC published articles in Countermeasure dealing with Vehicular Wheels (Mar 84), Maintenance Decisions (Sep 84), Trucks (Sep 84), Maintenance Training and Operators (Oct 84).

USASC developed a list of topics dealing with insufficient training for future articles in Countermeasure.

USASC to produce a film on maintenance activities.

PRINCIPAL CAUSE FACTOR: Unsafe equipment factors (i.e., errors due to inadequate facilities, required equipment not provided or equipment inadequately designed) represent 5% of the maintenance/repair/servicing problem.

COUNTERMEASURES:

USASC published articles in Countermeasure dealing with M901 Operation Hazards (Jan 84), Tank Accidents (Feb 84), and Parachute Containers (Mar 84).

PRINCIPAL CAUSE FACTOR: Physiological factors (i.e., errors due to fatigue or alcohol) represent 5% of the maintenance/repair/servicing problem.

COUNTERMEASURES:

USASC published articles in Countermeasure dealing with Fatigue, Drugs, and Alcohol (Apr 84), (May 84), (Jul 84), (Aug 84), and (Oct 84).

ON-DUTY PERSONNEL INJURIES

USASC developed a publication guide on Alcohol and Accidents.

USASC developed and incorporated a block of instruction on Alcohol for all relevant Safety Center courses.

PROBLEM AREA: Handling Materiel/Passengers

PRINCIPAL CAUSE FACTOR: Unsafe work practices (i.e., errors due to inadequate self-discipline and inadequate supervision) represent 74% of the handling materiel/passengers problem. Two examples in this category are:

- a. Improper lifting.
- b. Misuse of equipment or failure to use required equipment.

COUNTERMEASURES: USASC published articles in Countermeasure dealing with M2 Burners (Mar 84), Materiel Handling Injuries (Mar 84), Hands Off Training (Apr 84), Knee Injuries (May 84), Forklifts (Jun 84), and Back Injuries.

PRINCIPAL CAUSE FACTOR: Insufficient training (i.e., errors due to inadequate unit training or experience in performing materiel handling/lifting tasks) represent 17% of the handling materiel/passengers problem.

COUNTERMEASURES:

USASC published articles in Countermeasure dealing with Range Hazards (Jan 84), Accident Review (Feb 84), (Mar 84), Training (Aug 84), ARNG Driver Training (Oct 84).

USASC rewrote AR 600-55, Motor Vehicle Driver, Selection, Testing, and Licensing, to include mechanical/ground support equipment.

PRINCIPAL CAUSE FACTOR: Improper operating procedures (i.e., errors due to inadequate Technical Manuals (TM) and Standing Operating Procedures (SOP)) represent 9% of the handling materiel/passengers problem.

COUNTERMEASURES: Actions addressed under other cause factors.

PROBLEM AREA: Combat Soldiering

ON-DUTY PERSONNEL INJURIES

PRINCIPAL CAUSE FACTOR: Unsafe work practices (i.e., errors due to inadequate self-discipline and inadequate supervision) represent 57% of the combat soldiering problem. The leading example of this category is improperly performing parachute landing fall.

COUNTERMEASURES:

USASC published articles in Countermeasure dealing with Pyrotechnic Simulators (Jan 84), Heat Injury (Apr 84), Artillery Firing (Jun 84), Sunglasses (Jun 84), Cold Weather (Aug 84), Drug Abuse (Oct 84), Combat Soldiering (Oct 84), Laser Target Designator (Dec 84), and Targets (Dec 84).

USASC initiated development of an operational concept for safety in contingency operations.

USASC initiated development of an Army risk management policy which will lead directly to improved evaluation of the risks associated with a variety of combat soldiering activity.

PRINCIPAL CAUSE FACTOR: Insufficient training (i.e., errors due to inadequate school training, unit training or experience) represents 31% of the combat soldiering problems. The leading example of this category is insufficient unit training to prevent parachute landing errors by inexperienced personnel.

COUNTERMEASURES:

USASC published articles in Countermeasure dealing with DUD's (Jan 84), Slide for Life (Mar 84), Backing APC (Apr 84), Rolling APC (Oct 84).

USASC incorporated briefing of subject accident findings and recommendations to various Safety Center classes.

PRINCIPAL CAUSE FACTOR: Unsafe equipment factors (i.e., errors due to inadequate facilities, required equipment not provided or equipment inadequately designed) represent 6% of the combat soldiering problem.

COUNTERMEASURES: Actions addressed under other cause factors.

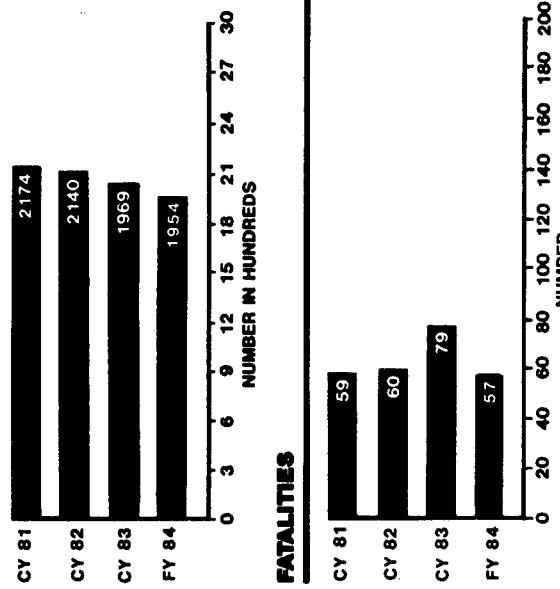
PRINCIPAL CAUSE FACTOR: Improper operating procedures (i.e., errors due to inadequate Technical Manuals (TM) and Standing Operating Procedures (SOP)) represent 6% of the combat soldiering problem.

COUNTERMEASURES: Actions addressed under other cause factors.

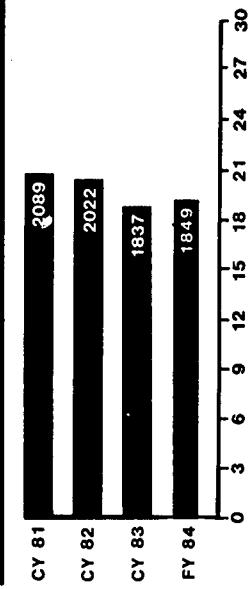
PERSONNEL INJURY-OTHER ACCIDENTS

Off Duty

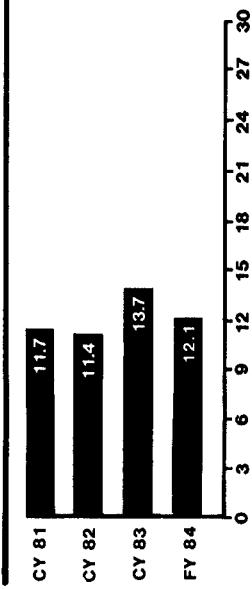
Accidents



NON-FATAL INJURIES



TOTAL COST



The declining trend in the number of off-duty personnel injury-other accidents continued in FY 84 with a 1% (-15) decrease from CY 83.

The number of off-duty personnel injury-other fatalities in FY 84 was 28% less (-22 fatalities) than the number in CY 83 and was lower than the number in both of the previous two years. This decrease stems primarily from a reduction (-17) in fatalities occurring during off-duty water related sports activities (swimming, diving, and scuba diving).

During FY 84 the number of off-duty personnel injury-other non-fatal injuries increased by 0.7% (+12 injuries) from CY 83 but remained much lower than the previous two years. Increases in injuries to military personnel during activities involving sports and human locomotion offset a decrease in injuries during activities involving personal hygiene/ food and drink consumption/sleeping and was the major contributing factor to the overall increase.

The total cost of off-duty personnel injury-other accidents decreased by 12% (\$1.6 million) in FY 84 compared to CY 83. The decrease in fatalities and fewer days lost and hospitalized as a result of military non-fatal injuries accounted for this decrease.

OFF-DUTY MILITARY INJURIES
FY 84

Activity	Total Injuries
1. Sports	894
2. Human Locomotion	465
3. Personal Hygiene/Sleeping	120
4. Maintenance/Repair/Servicing	113
5. Horseplay	66
6. Handling Materiel/Passengers	46
7. Janitorial/Housekeeping/Grounds	44
8. Food/Drink Preparation	36
9. Weapons Handling/Operation	32
10. Being a passenger	25
11. Miscellaneous (12 other activities)	63
12. Unreported	2
TOTAL	1,906
FATALITIES	57
NON-FATAL INJURIES	1,849
TOTAL	1,906
	1,906

Most (71%) of the off-duty military injuries occurred in two activities: sports (47%) and human locomotion (24%).

Sports. As expected, most of these injuries occurred in recreation/entertainment facilities. The sports primarily involved were basketball, softball, tackle football and touch football.

Human Locomotion. These injuries involved activities such as walking, running, and climbing. Most of these injuries occurred in housing facilities (individual and family) and on travel ways (pedestrian way and roadway).

OFF-DUTY PERSONNEL INJURIES

Sports	Basketball Softball Tackle Football Touch Football	SYSTEMIC CAUSE FACTORS	The principal cause factors identified in DOD 6055.7 are not reported for off-duty accidents. Therefore, corrective actions are keyed to the activity in general.
Human Locomotion	Walking Running Climbing	SYSTEMIC CAUSE FACTORS	The principal cause factors identified in DOD 6055.7 are not reported for off-duty accidents. Therefore, corrective actions are keyed to the activity in general.

OFF-DUTY MILITARY INJURIES

PROBLEM AREA: Sports (basketball, softball, tackle football, touch football)

PRINCIPAL CAUSE FACTOR: The principal cause factors identified in DOD 6055.7 are not reported for off-duty accidents. Therefore, corrective actions are keyed to the activity in general.

COUNTERMEASURES:

USASC published articles in Countermeasures dealing with Drowning (Mar 84), Sports Accidents (Mar 84), and Boats (Jul 84).

USASC developed accident prevention support package for softball.

USASC developed and incorporated into several Safety Center courses a block of instruction on Recreation Safety.

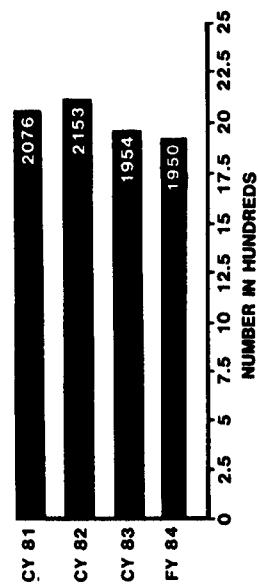
PROBLEM AREA: Human Locomotion (walking, running, climbing)

PRINCIPAL CAUSE FACTOR: The principal cause factors identified in DOD 6055.7 are not reported for off-duty accidents. Therefore, corrective actions are keyed to the activity in general.

COUNTERMEASURES: USASC published articles in Countermeasures dealing with Listening (Jan 84), Running (Mar 84), Knee Injuries (May 84), and Locomotion Accidents (Jun 84).

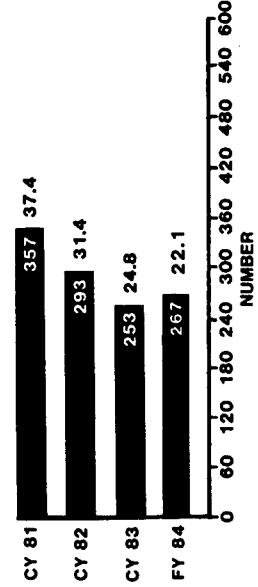
PRIVATELY OWNED VEHICLE ACCIDENTS

ACCIDENTS



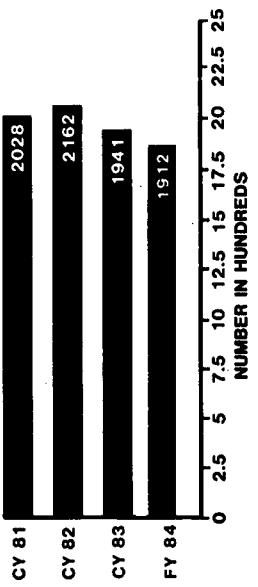
The number of POV accidents decreased by 0.2% (-4 accidents) in FY 84 compared to CY 83. This is a continuation of the decreasing trend from the peak experienced in CY 82.

FATALITIES



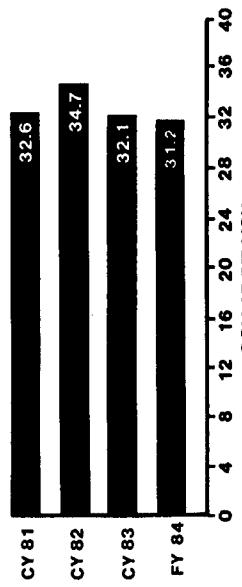
Although the number of fatalities resulting from POV accidents increased by 6% (+14 fatalities) in FY 84, compared to CY 83, it remained below the number for the previous two years. This increase is attributed to an increase in single-fatality accidents during FY 84.

NON-FATAL INJURIES



The decreasing trend in POV non-fatal injuries continued in FY 84 with a 1.5% decrease (-29 injuries) from CY 83.

TOTAL COST



POV costs decreased 2.8% (-\$0.9 million) in FY 84 compared to CY 83. This decrease is attributed to fewer days lost and hospitalized as a result of the reduction in non-fatal injuries which offset the increase in fatal injury cost.

POV ACCIDENTS
FY 84

Injuries
Accidents

Vehicle	Number	%	Cost	Fatal	Non-Fatal
Auto/sedan	272	58	11,260,707	170	184
Motorcycle/moped	101	21	3,452,040	46	62
Truck	34	7	970,135	18	22
Bicycle	18	4	87,207	1	15
Other POV	11	2	348,730	4	8
Train	11	2	441,260	9	2
Truck tractor	8	2	343,175	7	2
Van	8	2	157,280	3	9
Aircraft	3	1	141,000	3	0
Trailer	1	<1	47,000	1	0
Unreported	6	1	--	5	1
Total for on-duty and fatal off-duty accidents	473	100	17,248,534	267	305
Total for non-fatal off-duty accidents (abbreviated reports)	1477	--	13,938,592	0	1607
TOTAL	1950	--	31,187,126	267	1912

Driver Error

SYSTEMIC CAUSE FACTORS

The principal cause factors identified in DOD 6055.7 are not reported for off-duty accidents. Therefore, corrective actions are keyed to the errors in general.

- Improper Decision
- Misjudged Clearance/Speed/Weight/Size
- Improper Attention
- Failure To Follow Procedures/Orders/Laws
- Failure To Anticipate

POV ACCIDENTS

Of the 1950 POV accident reports received for FY 84, 1477 were abbreviated reports IAW AR 385-40. These were reports of non-fatal off-duty accidents not involving Army operations or materiel. The information provided on these abbreviated reports is limited and does not support analysis in terms of the vehicles involved or accident cause factors. Additionally, complete DA Form 285 has not been received to date on five fatal injuries. On the remaining 468 POV accidents, complete accident report information was provided.

The chart shows that two types of vehicles accounted for 80% of the POV accidents and 85% of the cost. These two types were autos/sedans and motorcycles/mopeds.

Most (53%) of these POV accidents (autos/sedans and motorcycles/mopeds) involved driver error. The most frequent errors were:

- a. Improper decision. This type error resulted most frequently in driving while under the influence of alcohol, excessive speed, and failure to use personal protective devices (seat belts and helmets).
- b. Misjudged clearance/speed/weight/size. This type of error resulted most frequently in excessive speed and loss of control.
- c. Improper attention. This type error resulted most frequently in loss of control, failure to yield right of way, and the individual exposing himself to harm.
- d. Failure to follow procedures/orders/laws. This type error resulted most frequently in excessive speed, failure to yield right of way, driving in wrong lane, and failure to use personal protective devices (seat belts and helmets).
- e. Failed to anticipate. This type error resulted primarily in loss of control.

PROBLEM AREA: Driver Error

PRINCIPAL CAUSE FACTOR: The principal cause factors identified in DOD 6055.7 are not reported for off-duty accidents. Therefore, corrective actions are keyed to the errors in general.

- a. Improper decision (driving while under the influence of alcohol; excessive speed; failure to use personal protective devices--seat belts and helmet).
- b. Misjudged clearance/speed/weight/size (excessive speed; loss of control).
- c. Improper attention (loss of control; failure to yield right of way; individual exposing himself to harm).
- d. Failure to follow procedures/orders/laws (excessive speed; failure to yield right of way; driving in wrong lane; failure to use personal protective devices--seat belts and helmets).
- e. Failed to anticipate (loss of control).

COUNTERMEASURES:

USASC published articles in Countermeasures dealing with POV accidents (Oct 83), Enforcement (Jul 84), Motorcycle (Jul 84), and Drunk Driving (Oct 84).

USASC developed and distributed a publication titled "The Alcohol and Accident Guide" (Feb 84).

USASC published several articles in Countermeasures dealing with Driver Error in POV Accidents (Oct 83), (Dec 83), (Jan 84), and (Jul 84).

USASC developed and distributed an accident prevention support package to pursue seat belt usage. The seat belt program was supported by bumper stickers and a Chief of Staff message directing support.

USASC developed and fielded posters, television and radio spots, and articles for magazines.

USASC included blocks of instruction in various Safety Center courses relating to this problem.

PRINCIPAL CAUSE FACTORS:

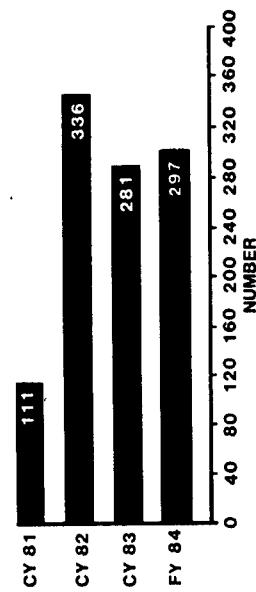
- a. Failed to anticipate (loss of control).
- b. Improper attention (loss of control).
- c. Misjudged clearance/speed/weight/size (excessive speed; loss of control).
- d. Failure to follow procedures/orders/laws (excessive speed; failure to use personal protective devices--seat belts and helmets).

COUNTERMEASURES: Developed and included blocks of instruction in various Safety Center courses relating to this problem.

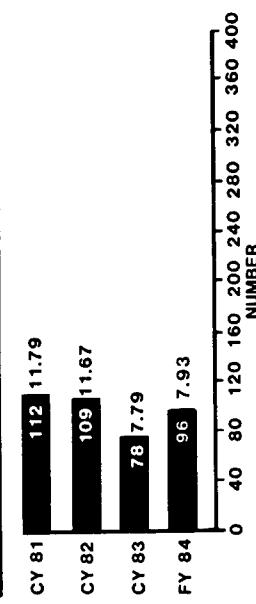
PRIVATELY OWNED VEHICLE ACCIDENTS

(With Alcohol Involvement On Part Of Army Operator)

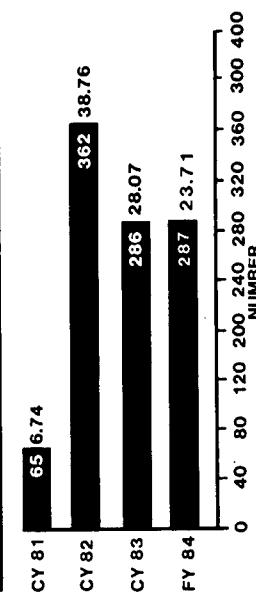
ACCIDENTS



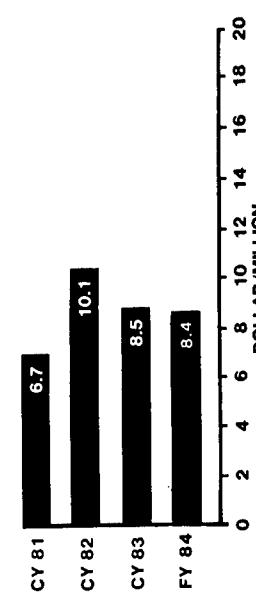
FATALITIES



NON-FATAL INJURIES



TOTAL COST



Military Rates Per Hundred Thousand Military Population

The number of POV accidents in FY 84 in which the Army operator was evidenced as having consumed alcohol was 6% more (+16 accidents) than the number reported for CY 83. This is attributed to a 54% increase (+29 accidents) involving motorcycle/moped operators.

Fatal injuries increased by 23% (+18 fatalities) in FY 84 compared to CY 83. This resulted from an increase in fatal injuries in automobiles (sedans, station wagons).

Overall, non-fatal injuries remained about the same. However, motorcycle/moped non-fatal injuries increased by 66% (+29 non-fatal injuries) in FY 84 over CY 83. Other notable increases in non-fatal injuries occurred in accidents involving truck and van operators who had consumed alcohol. These increases were offset by a 20% decrease (-44 non-fatal injuries) in non-fatal injuries in automobiles with drinking drivers.

The total cost of these accidents remained about the same as CY 83 even though there was an increase in the number of accidents and injuries. This resulted from fewer days lost and hospitalized, as well as fewer permanent total disabling injuries.

FY 84 PRIVATELY OWNED VEHICLE ACCIDENTS
 (With Alcohol Involvement on Part of Army Operator)

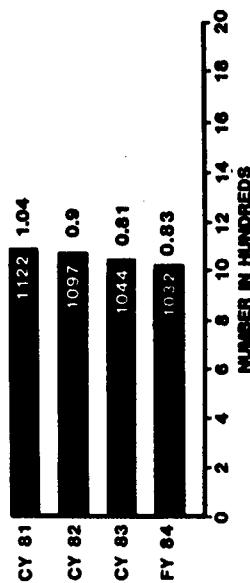
	Four-Wheel			Two-Wheel		
	Total	Alcohol Related	% Alcohol Related	Total	Alcohol Related	% Alcohol Related
Accidents	1,223	211	17	681	86	13
Fatalities	205	81	40	48	15	31
Non-fatal Injuries	1,213	211	17	662	76	12
Injury & Death Costs	\$20.1M	\$6.2M	31	\$10.1M	\$2.2M	22
Lost Workdays	26,967	5,820	22	16,995	2,237	13

NOTE:

1. Data excludes POV snowmobiles, commercial and private planes, and commercial trains.
2. Two-wheel data includes motorcycles, mopeds, and bicycles.

U.S. ARMY MOTOR VEHICLE ACCIDENTS

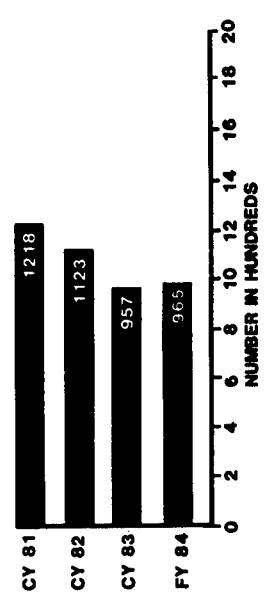
ACCOUNTS



NON-FATAL INJURIES



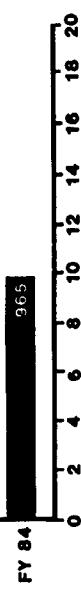
TOTAL COST



Accident Rate Per Million Miles, Fatality Rate Per Hundred Million Miles

The downward trend in AMV accidents continued in FY 84 with a 1% decrease (-12 accidents) from CY 83.

The number of AMV fatalities decreased by 13% (-7 fatalities) in FY 84 compared to CY 83, the second consecutive year for a decrease.



As a result of fewer accidents and the decrease in fatalities, total AMV accident costs decreased by 1% (\$0.1 million).

Injuries

Vehicle	Accidents			Injuries		
	Number	%	Cost	Fatal	Non-Fatal	
Tactical						
4-ton truck	219	21	2,962,670	7	250	
5-ton truck	96	9	3,092,406	11	85	
2½-ton truck	86	8	2,706,193	5	78	
M880/890 truck	49	5	788,404	0	50	
Over 10-ton truck	36	3	1,042,668	2	21	
Gamma goat	30	3	1,468,572	1	42	
Tactical trailer	14	1	235,362	1	9	
8- & 10-ton trucks	13	1	373,820	3	7	
CUCV	10	1	405,371	1	9	
HET	4	<1	460,521	0	3	
½- & 1½-ton trucks	1	<1	5,735	0	1	
Other tactical veh.	127	12	1,778,924	6	100	

Commercial

Sedan/station wagon	114	11	949,390	3	108	
Van	53	5	407,757	1	49	
½- & ¾-ton trucks	47	5	468,170	2	41	
Over 2-ton truck	31	3	287,654	0	32	
Bus	14	1	206,566	0	16	
Contractor vehicle	14	1	131,860	0	3	
Truck - tractor	9	1	95,853	0	7	
Motorcycle/moped	9	1	18,215	0	9	
1- & 2-ton trucks	5	<1	19,702	0	7	
CJ5/6/7	2	<1	82,069	0	3	
Trains	1	<1	160,740	0	1	
Other commercial veh.	48	5	339,344	3	34	
TOTAL	1,032	100	18,487,966	46	965	

AMV ACCIDENTS

This chart shows that four types of vehicles accounted for 50% of the AMV accidents and 53% of the cost. These four types were $\frac{1}{2}$ -ton trucks, 5-ton trucks, $2\frac{1}{2}$ -ton trucks, and sedans/station wagons. In the following paragraphs, accidents involving these vehicles are analyzed with respect to driver errors and materiel failures. Of these accidents which specified type of training involved, 86% occurred in unit proficiency training, with the remaining 14% divided between advanced and unit on-the-job training.

Driver Error
Improper Decision
Failed To Anticipate
Misjudged Clearance/Speed/Weight/Size
Improper Attention
Failed To Recognize
Failed To Follow Procedures/Orders/Laws

SYSTEMIC CAUSE FACTORS

Unsafe Work Practices
Insufficient Training
Physiological Factors
Improper Operating Procedures
Unsafe Equipment Factors

Materiel Failure

Brakes
Wheels
Transmission
Steering

SYSTEMIC CAUSE FACTOR

Inadequate Preventive Maintenance Program

AMV ACCIDENTS INVOLVING DRIVER ERROR
FY 84

Type Vehicle	No. of Accds	Driver Error*					
		Improper Decision	Failed to Anticipate	Misjudged Clearance/ Speed/Weight Size	Improper Attention	Failed to Recognize	Failed to Follow Procedures/ Orders/Laws
1/2-ton truck	144	19	19	18	10	9	10
5-ton truck	45	25	10	16	15	11	10
2 1/2-ton truck	49	20	13	15	15	18	3
Sedan/station wagon	51	18	25	10	18	8	11

* Of 14 driver errors available for selection by field investigators, the 6 shown were reported with the greatest frequency for accidents involving the top 4 vehicles.

AMV ACCIDENTS INVOLVING DRIVER ERROR

Most (56%) of these AMV accidents (1/2-ton trucks, 5-ton trucks, 2 1/2-ton trucks, and sedan/station wagons) involved driver error. As shown in the chart, the most frequent errors were:

- a. Improper decision. This error resulted in excessive speed, loss of control, and driving while under the influence of alcohol.
- b. Failed to anticipate. This type error resulted primarily in loss of control.
- c. Misjudged clearance/speed/weight/size. This type error resulted in excessive speed and loss of control.
- d. Improper attention. This error resulted primarily in loss of control.
- e. Failed to recognize. This error resulted primarily in loss of control.
- f. Failed to follow procedures/orders/laws. These errors resulted in excessive speed and loss of control.

AMV ACCIDENTS INVOLVING MATERIEL FAILURES
FY 84

Type Vehicle	No. of Accds*	Percent of Accidents by Component				
		Wheels	Brakes	Fuel	Other	Unreported
$\frac{1}{4}$ -ton truck	13	31	15	15	23	16
		Brakes	Wheels	Steering	Other	Unreported
5-ton truck	18	56	6	6	27	5
		Brakes	Transmission	Engine	Other	Unreported
$2\frac{1}{2}$ -ton truck	12	25	17	8	33	17
		Brakes	Wheels	Steering	Unreported	Unreported
Sedan/station wagon	4	25	25	25	25	--

Only 9% of these AMV accidents involved materiel failure/malfunction. As shown on the chart, the most frequent components involved were:

- a. Brakes for all top four AMVs. Brake failures in 5-ton trucks involved the hydraulic portion of the brake system. The primary cause of these failures appears to be inadequate maintenance.
- b. Wheels (rims and tires/tubes combined) for $\frac{1}{4}$ -ton trucks, 5-ton trucks, and sedan/station wagons. Blowouts were responsible for all $\frac{1}{4}$ -ton truck tire failures. It is suspected that improper inspection of these tires prior to dispatch was the leading cause factor.

FY 84 ARMY MOTOR VEHICLE ACCIDENTS
 (With Alcohol Involvement on Part of Army Operator)

There were 1,022 AMV accidents in four-wheeled vehicles in FY 84. Of these, 2% (21) involved Army operators who were driving under the influence of alcohol. These alcohol-related accidents accounted for 3% (25) of the injuries (fatal and non-fatal) and 2% (\$0.2M) of the cost of AMV accidents in four-wheeled vehicles.

There were nine AMV accidents in two-wheeled vehicles in FY 84. None of these reported alcohol involvement on the part of the Army operator.

FY 84 ARMY MOTOR VEHICLE ACCIDENTS
 (With Alcohol Involvement on Part of Army Operator)

	Four-Wheel			Two-Wheel		
	Total	Alcohol Related	% Alcohol Related	Total	Alcohol Related	% Alcohol Related
Accidents	1,022	21	2	9	0	0
Fatalities	46	1	2	0	0	0
Non-fatal Injuries	955	24	3	9	0	0
Injury & Death Costs	\$8.2M	\$0.2M	2	\$0.02M	0	0
Lost Workdays	16,284	641	4	64	0	0

NOTE:

1. Data excludes one AMV train accident involving one non-fatal injury and a cost of \$0.2M.
2. Property damage cost of \$10.1M is not included.

PROBLEM AREA: Driver error (improper decision; improper attention; failed to anticipate; misjudged clearance/speed/weight/size; failed to follow procedures/orders/laws; failed to recognize).

PRINCIPAL CAUSE FACTOR: Unsafe work practices (i.e., errors due to inadequate discipline of driver or inadequate supervision by vehicle commander) represent 70% of the driver error problem. The following are the top four unsafe work practices among those identified for the reporting period.

- a. Operating vehicles at speeds excessive for road conditions, posted limits, and vehicle design.
- b. Errors at intersections and crosswalks.
- c. Failure to stay alert or attentive to the road.
- d. Following too closely.

COUNTERMEASURES:

USASC developed articles for Countermeasures dealing with Seat Belts (Dec 84), (May 84), Ground Guides (Apr 84), AMV Accidents (May 84), Excessive Speed in M151's (May 84), Unsafe Driving Practices (Nov 83), (Jan 84), (May 84), (Jun 84), and (Aug 84), and M151 Fatal Accidents (May 84).

USASC recommended that TRADOC develop exportable driver training packets for each type vehicle. Transportation Corps is developing a standardized Training POI for the packets.

USASC developed a block of instruction dealing with the hazards and suggested counter-measures for various Safety Center accident prevention courses.

PRINCIPAL CAUSE FACTOR: Insufficient training (i.e., errors due to inadequate school training, unit training or experience) represents 19% of the driver error problem. Unit training and driver experience were inadequate primarily for properly adjusting speed and maintaining control on adverse/changing road conditions.

COUNTERMEASURES:

USASC developed articles for Countermeasures dealing with Goer Accidents, CUCV Hazards, 5-Ton Truck Accidents, Cold Weather Driving, Black Ice, NVG Hazards, and Vehicle/Runner/Formation Hazards.

USASC provided the Transportation Corps a "Guide for Safety in Soldier Manuals" for inclusion in the self-paced workshop for soldier training publication writers.

USASC is revising AR 600-55, Motor Vehicle Driver, Selection, Testing and Licensing, to update procedures and training for standardized training and licensing.

USASC initiated worldwide distribution of the very successful 37th Transportation Group Program to improve driver training through accident analysis and command emphasis.

PRINCIPAL CAUSE FACTOR: Physiological factors (i.e., driver errors due to fatigue or alcohol) represent 4% of the driver error problem.

COUNTERMEASURES:

USASC developed numerous articles for Countermeasures relating to the problem of Drinking and Driving (Oct 83), (Jan 84), (May 84), (Jun 84), (Jul 84).

USASC is revising AR 385-55, "Prevention of Motor Vehicle Accidents" to include reduction of maximum driver time in AMVs.

PRINCIPAL CAUSE FACTOR: Improper operating procedures (i.e., driver errors due to inadequate operators manuals and Standing Operating Procedures (SOP)) represent 4% of the driver error problem.

COUNTERMEASURES: Actions addressed under other cause factors.

PRINCIPAL CAUSE FACTOR: Unsafe equipment factors (i.e., driver errors due to inadequate facilities, required equipment not provided or equipment inadequately designed) represent 3% of the driver error problem.

COUNTERMEASURES: Actions addressed under other cause factors.

PROBLEM AREA: Materiel failure (brakes; wheels; transmission; steering)

PRINCIPAL CAUSE FACTORS:

The principal cause factors identified in DOD 6055.7 are not identified on the majority of Army motor vehicle materiel failures. Therefore, the information below is based on the small number of accidents which reported OSHA causal factors.

Inadequate preventive maintenance programs (i.e., materiel failures/malfunctions due to inadequate maintenance) represent 100% of the materiel failure/malfunction problem. Two examples in this category are:

- a. Before-during-after (BDA) operation checks of vehicles were not performed or were performed inadequately.
- b. Required repairs were not performed.

COUNTERMEASURES:

AMC required TACOM to develop PIP for rollover protection and restraint systems for Gamma Goat, 2½- and 5-ton trucks. AMC has been directed to develop a system for M151's.

USASC developed some six articles for Countermeasures dealing with Preventive Maintenance (Nov 83), (Sep 84), Poor Maintenance (Mar 84), Defective Tires (Apr 84), (May 84), and Brake Lines (May 84).

SAFETY-OF-USE Advisory messages were issued by TACOM addressing Brake Problems (Jul 84), Winches (Jun 84), and Axles (Jul 84). TACOM also sent messages to the field advising on problem areas of spare tires, engine runaway and zenith carburetors.

AMV

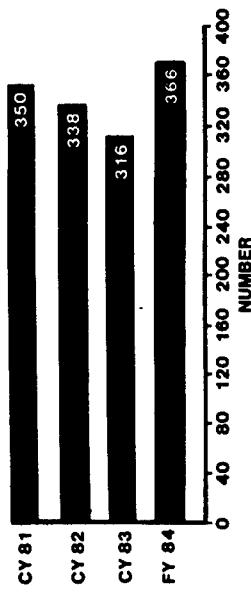
USASC developed and distributed decals giving explicit instructions on "How to Jump Start."

TACOM is to change all vehicle operator manuals (-10 TM) to include procedures for connecting and disconnecting towed equipment.

USASC developed blocks of instructions dealing with these hazards and suggested countermeasures for Safety Center accident prevention courses.

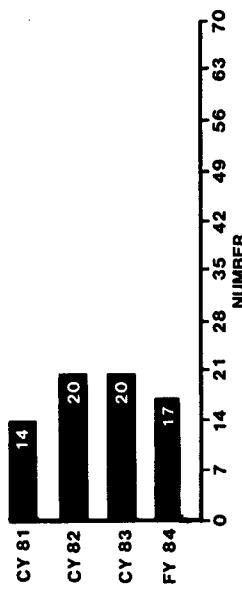
COMBAT VEHICLE ACCIDENTS

ACCIDENTS



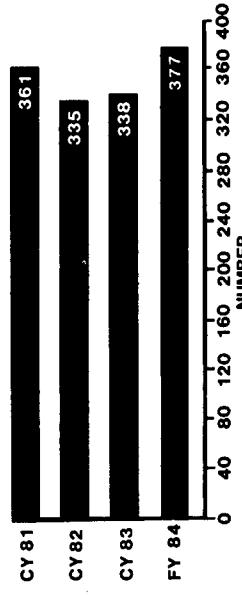
FATALITIES

Fatalities decreased by 15% (-3 fatalities) in FY 84 compared to CY 83. This resulted from fewer carrier fatalities in FY 84.



NON-FATAL INJURIES

During FY 84, non-fatal injuries increased by 12% (+39 injuries) compared to CY 83. This was primarily a result of increases in injuries associated with M60 tanks, M1 tanks, and self-propelled howitzers.



TOTAL COST

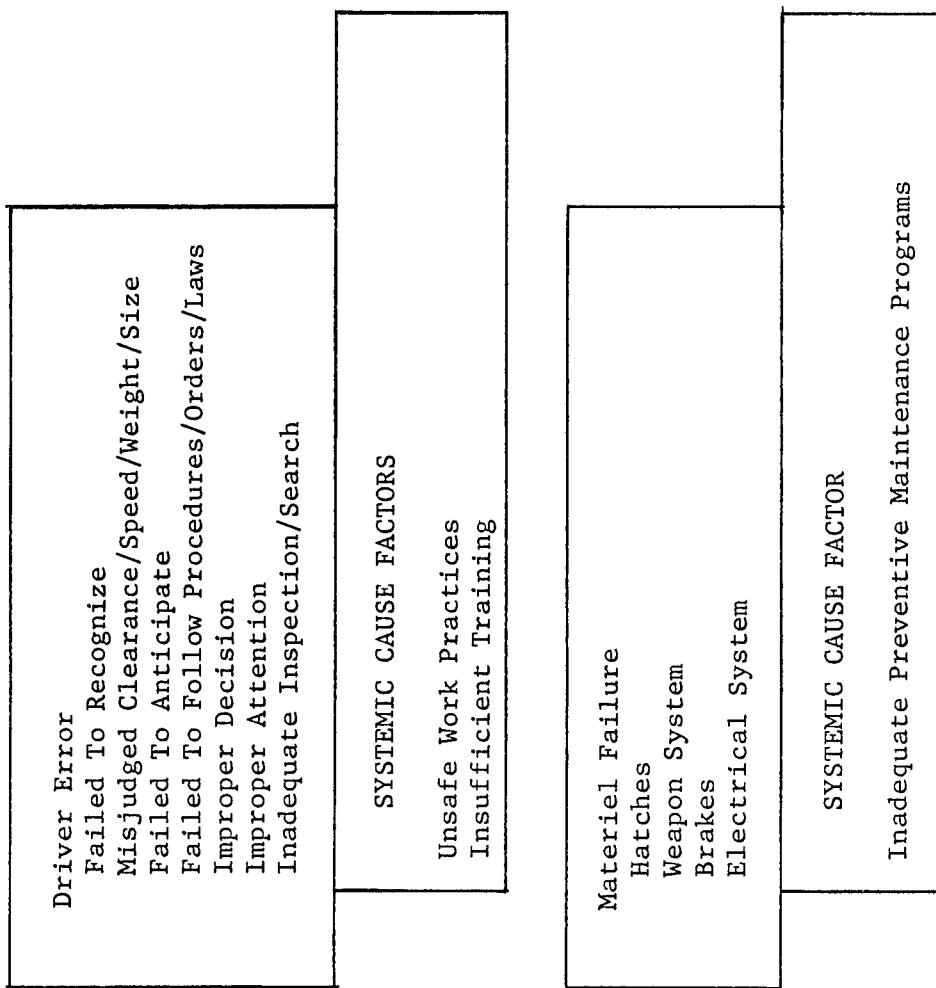
An increase of 14% (+\$0.7 million) in the total cost of combat vehicle accidents during FY 84 is primarily a result of increased property damage involving the M1 tank.

COMBAT VEHICLE ACCIDENTS

This chart shows that three types of vehicles accounted for 70% of the combat vehicle accidents and 33% of the cost. These three types were M113 carriers, other carriers, and M60 tanks. The reason for a separate category entitled "other carriers" is because, although they have the same basic chassis as the M113, they have different equipment and are used for different tasks (e.g., M577 command carrier, M548 ammo carrier). In the following paragraphs, accidents involving these vehicles are analyzed with respect to driver error and materiel failure. Of these accidents which specified type of training involved, 80% occurred during unit proficiency training, with the remaining 20% divided between unit on-the-job and basic training.

Vehicle	Number	Accidents %	Injuries		
			Cost	Fatal	Non-Fatal
1. M113 carrier	112	31	671,433	4	123
2. Other carrier	75	20	822,367	5	81
3. M60 tank	70	19	376,616	2	69
4. M1 tank	33	9	2,478,568	2	27
5. SP guns and Howitzer	23	6	107,014	1	23
6. VTR	16	4	734,808	2	20
7. M48 tank	14	4	104,130	1	13
8. Other tank	12	3	52,335	0	11
9. M551 Sheridan	6	2	14,730	0	6
10. AVLB	3	1	39,746	0	2
11. Other track vehicle	2	1	272,140	0	2
 TOTAL	 366	 100	 5,672,887	 17	 377

COMBAT VEHICLES



COMBAT VEHICLE ACCIDENTS INVOLVING DRIVER ERROR
FY 84

Driver Error*

Type Vehicle	No. of Acdts	Driver Error*						
		Misjudged Clearance / Speed / Weight/Size	Failed to Follow Procedures / Anticipate Orders/Laws	Improper Decision	Improper Attention	Inspec tion / Search		
M113 carrier	34	14	22	17	14	8	8	6
Other carrier	27	18	15	18	15	9	6	15
M60 tank	11	36	—	—	—	18	27	9

*Of 14 driver errors available for selection by field investigators, the 7 shown were reported with the greatest frequency for accidents involving the top 3 vehicles.

COMBAT VEHICLE ACCIDENTS INVOLVING DRIVER ERROR

Thirty-two percent of these combat vehicle accidents (M113 carriers, other carriers, and M60 tanks) involved driver error. As shown in the chart, the most frequent errors were:

- a. Failed to recognize. This type error resulted most frequently in the individual exposing himself to harm and loss of control.
- b. Misjudged clearance/speed/weight/size. This type error resulted primarily in loss of control.
- c. Failed to anticipate. This type error resulted in the individual exposing himself to harm and loss of control.
- d. Failed to follow procedures/orders/laws. This type error resulted most frequently in the individual exposing himself to harm and loss of control.
- e. Improper decision. This type error resulted most frequently in the individual exposing himself to harm and failure to use personal protective devices (seat belts and helmets).
- f. Improper attention. This type error resulted most frequently in the individual exposing himself to harm, loss of control, and failure to lock/block/secure.
- g. Inadequate inspection/search. This type error resulted primarily in failure to lock/block/secure.

COMBAT VEHICLE ACCIDENTS INVOLVING MATERIEL FAILURES

Only 13% of these combat vehicle accidents involved materiel failure/malfunction. As shown on the chart, the most frequent components involved were:

- a. Hatches for M113 carriers and other carriers. These malfunctions were probably allowed to injure personnel because personnel failed to properly maintain the hatch safety pins.
- b. Electrical system. These malfunctions involved different electrical subsystems/parts and were not attributable to a common cause.
- c. Transmission. These malfunctions involved different transmission subsystems/parts. Most malfunctions resulted from personnel not complying with general maintenance inspection and installation requirements.

**COMBAT VEHICLE ACCIDENTS INVOLVING MATERIEL FAILURES
FY 84**

Type Vehicle	No. of Accdts	Percent of Accidents by Component				
M113 Carrier	10	Hatches	Electrical System	Transmission	Tracks	
		40	20	20	20	
Other Carrier	16	Hatches	Electrical System	Transmission	Tracks	Brakes
		50	6	6	6	6
M60 Tank	8	Electrical System	Transmission	Brakes	Body	Axles
		13	13	13	13	13
						Other
						35

COMBAT VEHICLES

PROBLEM AREA: Driver error (failed to recognize; misjudged clearance/speed/weight/size; failed to anticipate; failed to follow procedures/orders/laws; improper decision; improper attention; inadequate inspection/search)

PRINCIPAL CAUSE FACTOR: Unsafe work practices (i.e., errors due to inadequate self-discipline of driver or inadequate supervision by vehicle commander) represent 67% of the driver error problem. Two examples in this category are:

- a. Improper precautions for environmental conditions.
- b. Improper body position.

COUNTERMEASURES:

USASC developed articles for Countermeasures dealing with Marijuana (Oct 83), Slave Starts (Nov 83), Batteries (Dec 83), Ground Guides (Dec 83), (Apr 84), Tanks (Feb 84), Bradley Fighting Vehicle (Feb 84), Artillery (Jun 84), and Cold Weather (Aug 84).

TRADOC is incorporating in FM 21-17, "Driver Selection, Training, and Supervision, Track Combat Vehicles," and FM 21-306, "Manual for Track Combat Vehicle Driver," more guidance on ground guiding tracked vehicles.

USASC has begun production of a film titled "Operating Tracked Vehicles . . . The Safe Way."

USASC provided the Army Training Support Center with an accident prevention guide to be included in the soldier's manual.

AMC issued Hazard Alerts for the M48A5 tanks dealing with shell casings (Nov 83) and on M548 ammo carrier dealing with throttles (Mar 84).

USASC analyzed and prepared Technical Report 84-1 dealing with Tracked Vehicle Accidents. Technical Report 84-2 updated Tracked Vehicle Fixes, and Technical Report 84-3 analyzed Tracked Vehicle Run-Over Accidents.

COMBAT VEHICLES

PRINCIPAL CAUSE FACTOR: Insufficient training (i.e., errors due to inadequate unit training) represent 33% of the driver error problem.

*It should be noted that only a small number of Army combat vehicle accidents report OSHA causal factors. The above information is based only on those accidents reporting cause factors.

COUNTERMEASURES: Actions addressed under other cause factors.

PROBLEM AREA: Materiel failure (hatches; weapon systems; brakes; electrical system)

PRINCIPAL CAUSE FACTOR:

The principal cause factors identified in DOD 6055.7 are not identified on the majority of Army combat vehicle materiel failures. Therefore, the information below is based on the small number of accidents which reported OSHA causal factors.

Inadequate preventive maintenance programs (i.e., materiel failures/malfunctions allowed by inadequate inspection or inadequate installation) represent 100% of the materiel failure/malfunction problem. Two examples of this category are:

- a. Personnel failing to inspect hatch components.
- b. Personnel failing to inspect vehicle tow bar prior to use.

COUNTERMEASURES:

USASC developed articles for Countermeasures dealing with M901 ITV Gunners Seat (Jan 84), Antenna Wire Strikes (Feb 84), MRV Transmission (May 84), Asbestos Seal Lining (Aug 84), and Track Vehicle Fire (Sep 84).

USASC recommended that AMC study design of M109A2/A3 howitzer; apply ECP on M48A5 tanks which have not been modified with turret guard; to expedite procurement of combat vehicle crewmen coveralls, arimid green; change operators manual for M548 to reflect non-mission capable status for inoperable neutral safety switch; "people-proof" the installation of the neutral safety switch in the M548; to improve wording in -20 manual

COMBAT VEHICLES

concerning transmission range selector adjustment procedures for the M548; issue safety-of-use message concerning M88 MRV bent transmission control rods; revise -10 and -20 manuals to include checks for bent transmission control rods for M88-MRV; publish cautions concerning limitations of NVD in M1 operator's manual; develop solution for quick escape problem when M1 is inverted; evaluate current manual windshield wiper operation when NVD is installed in M1.

USASC recommended that TRADOC develop a "dead vehicle" light system for MILES that does not impair night vision.

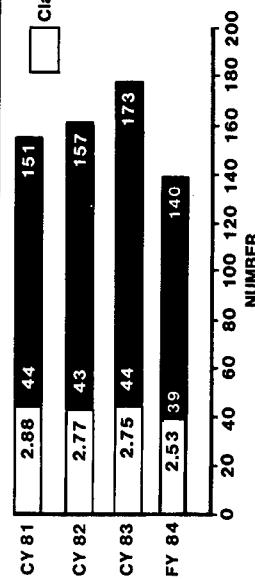
USASC developed a lessons learned packet for combat vehicles, reviewed 94 combat vehicle product improvement proposals, and made recommendations to PS Magazine for article publication.

AMC has tasked TACOM Human Engineering Laboratory Detachment to conduct studies to determine the feasibility of developing a "standard" instrument panel to be used in all future ACV procurements.

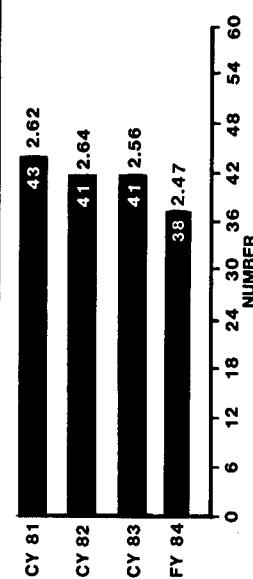
USASC developed an Armor Battalion Kit for distribution which addressed combat vehicle problems and is in the process of developing a Track Vehicle Kit.

U.S. ARMY AVIATION FLIGHT MISHAP EXPERIENCE

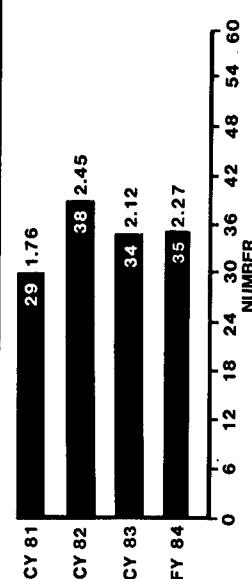
CLASS A,B,C MISHAPS



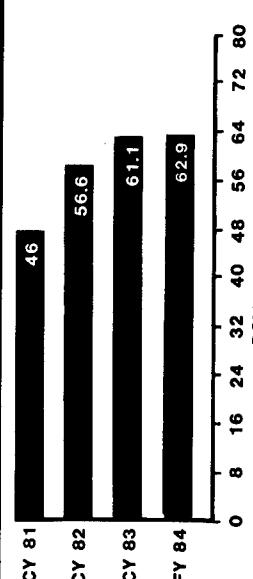
DESTROYED AIRCRAFT



FATALITIES



CLASS A,B,C COST



X.X = Class A Rate Per 100,000 Flying Hours

ARMY AVIATION ACCIDENT ANALYSIS

This chart shows the FY 84 aviation accident experience. Included are 145 class A, B, C accidents and related dollar losses by type aircraft system. Of these accidents, five are non-flight (aviation ground) accidents and 140 are flight accidents. Rotary wing aircraft systems are rank ordered (high to low) by frequency of accident occurrence.

Utility helicopters are the single greatest source of A, B, and C accidents and dollar losses. Utility helicopters have the greatest exposure in terms of number of aircraft in the field environment. While exposure may explain the high numbers, the greatest gains for reduction of accidents and dollar losses can be made in the utility helicopter area. These utility helicopter accidents were analyzed. Results: No indication of any new cause factor patterns or any factors that were notably different from the previous years. Human error accounted for most (71%) of all class A, B, and C aviation accidents.

ARMY AVIATION ACCIDENT ANALYSIS

FY 84

Aircraft Type	FLIGHT			NON-FLIGHT			TOTAL	
	Number of Class A, B, &C Accidents	Total Cost	Number of Class A, B, &C Accidents	Total Cost	Number of Class A, B, &C Accidents	Total Cost		
Utility Helicopter	60	45.3M	1	<.1M	61	45.3M		
Observation Helicopter	25	3.5M	2	.1M	27	3.6M		
Attack Helicopter	17	1.1M	1	.2M	18	1.3M		
Cargo Helicopter	15	4.7M	0	.0M	15	4.7M		
Trainer (TH-55)	6	0.5M	0	.0M	6	0.5M		
Fixed Wing	17	7.8M	1	.1M	18	7.9M		
TOTAL	140	62.9M	5	.4M	145	63.3M		

AVIATION

<p>Human Error Inadequate Flight Planning Improperly Divided Attention Inaccurately Estimated Clearance/Closure Improperly Monitored Performance Failed To Follow Procedures</p>	<p>SYSTEMIC CAUSE FACTORS</p> <ul style="list-style-type: none">Unsafe Work PracticesInadequate TrainingUnsafe Equipment FactorsImproper Operating Procedures	<p>Materiel Failure/Maintenance</p> <p>SYSTEMIC CAUSE FACTORS</p> <ul style="list-style-type: none">Unsafe Equipment FactorsInadequate Preventive Maintenance
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PROBLEM AREA: Human error (inadequate flight planning; improperly divided attention; inaccurately estimated clearance/closure; improperly monitored performance of personnel, failed to follow procedures)

PRINCIPAL CAUSE FACTOR: Unsafe work practices (i.e., errors due to inadequate self-discipline of flight crew or inadequate supervision by IP/other supervisors) represent 59% of the human error problem.

COUNTERMEASURES:

Vice Chief of Staff of the Army has issued directives and dispatched numerous "Thurman Sends" messages to MACOM and activities delineating command involvement, specifying mission planning procedures and aircraft operating procedures/restrictions, and emphasizing his expectations in dealing with those who violate procedures.

USASC has publicized in FLIGHTFAX the events and circumstances surrounding mishaps. This weekly publication with its wide circulation serves as a forum to elevate awareness among flight crews and commanders of the mishaps caused by inadequate self-discipline and supervision.

USASC has developed a high-risk aviator tracking system which is designed to improve accountability of those individuals knowingly violating regulations, operating procedures or prudent air discipline of their own volition.

USASC published two pamphlets on Class A and B mishaps with findings and recommendations for each mishap (Aircraft Mishap Facts: Second Half FY83 Review and Aircraft Mishap Facts: First Half FY84 Review).

USASC produced and released a film, "Alcohol, Aviators, and Accidents - A Problem of Attitude" dealing with degradation of mental and physical abilities of aviators because of alcohol hangover.

USASC produced and released a film, "Flight Plan to a Dead End - A True Story" dealing with the adverse psycho-physiological effects of marijuana use and how it degrades the mental and physical abilities of aviators.

USASC submitted articles to US Army Aviation Digest - "Alcohol and the Aviator", "The Human Factor in Aviation Mishaps", and "Summer Training Exercises."

USASC continually incorporates new mishap information into the various Safety Center aviation-oriented classes.

PRINCIPAL CAUSE FACTOR: Inadequate training (i.e., errors due to inadequate school training, inadequate unit training, or inadequate experience) represents 20% of the human error problem.

COUNTERMEASURES:

Vice Chief of Staff of the Army issued directives in a "Thurman Sends" message requiring commanders to be instructor pilot (IP) qualified in their unit's primary mission aircraft. Additionally, a VCSA message dispatched in Mar 84 addressed pilot in command (PIC) selection and training as well as aircrew selection for missions.

USASC has publicized in FLIGHTFAX events and circumstances surrounding mishaps due to this causal factor, and includes lessons learned in the various Safety Center accident prevention courses.

PRINCIPAL CAUSE FACTOR: Unsafe equipment factors (i.e., errors due to inadequate equipment design) represent 6% of the human error problem.

COUNTERMEASURES:

Vice Chief of Staff of the Army has issued directives in a "Thurman Sends" message which specifically addressed operational restrictions for OH-58 helicopters. The restrictions are intended to reduce the potential for an aircraft getting into a design-induced loss of tail rotor effectiveness (LTE) situation.

USASC and TRADOC developed and distributed a videotape concerning loss of tail rotor effectiveness (LTE) in the OH-58. And, articles in Flightfax and the Aviation Digest have addressed the LTE subject.

AMC has instituted measures to correct hazards on the UH-60 aircraft by a redesigned fail-safe cover assembly and the throttle quadrant.

USASC was an active participant with the Blue Ribbon Panel to analyze mast bumping of the UH-1 and AH-1 helicopters.

PRINCIPAL CAUSE FACTOR: Improper operating procedures (i.e., errors due to inadequately written procedures for normal and emergency conditions) represent 11% of the human error problem.

COUNTERMEASURE:

USASC initiated changes to AR 95-1 which changed altitude minimums for single engine training and modified the inter-communications system of the UH-1.

PROBLEM AREA: Materiel failure/malfunction

PRINCIPAL CAUSE FACTOR: Unsafe equipment factors (i.e., failures resulting from inadequate design of equipment/materiel, manufacture/quality control, and inadequate written procedures) represent 56% of the materiel failure/malfunction problems.

COUNTERMEASURES:

USASC and AMC coordinated to issue Safety-of-Flight messages concerning the landing gear of OV-1 airplanes, engine transmission on the CH-47 helicopter, flight control tubes of the CH-47, tail rotor gearbox of the UH-60 helicopter, and pitch control links of the UH-1 helicopter.

USASC recommended that the Army replace the present teetering rotor system of the UH-1, OH-58 and AH-1 to eliminate the "Mast Bumping" problem.

PRINCIPAL CAUSE FACTOR: Inadequate preventive maintenance programs (i.e., inadequacies caused by maintenance) represent 38% of the materiel failure/malfunction problems.

COUNTERMEASURE:

AMC effected an engineering change proposal (ECP) to modify bolts in the UH-60 flight control system.

SPECIAL INTEREST ITEMS

Program Objectives

- Ensure that system acquisition, evaluation, and utilization policies and procedures minimize accident risk consistent with mission needs and resource requirements.
- Ensure that system modifications designed to enhance safety are funded and applied consistent with mission needs and resource requirements.
- Ensure that system modifications designed to meet operational needs do not degrade the safety performance of the system.

AMC System Safety Program

Accomplishments

System safety engineering support to numerous programs/projects

Program to identify/improve top 20 injury-producing systems

Increased safety input to decision makers

Areas of concern

Inadequate personnel resources

Increased workload

Increased emphasis on rapid procurement

1985 plans to strengthen program

Implement system safety scorecards

Establish explosives production equipment hazard tracking system

Improve program evaluations

The Army System Safety Program

COE System Safety Program

Accomplishments

Developed draft facility system safety (FASS) program guidance document

Drafted changes to AR 415 series incorporating FASS into MILCON program

Areas of concern

Lack of resources to fully implement FASS program

Inadequate understanding of FASS concepts in COE community

Historical facility accident data scare

1985 plans to strengthen program

Continue efforts to resource program

Present FASS training to safety career interns

Develop a facility hazard data base

Accomplishments

Independent system safety assessment for major systems prior to each milestone review

Adequacy of system safety program

Significant system hazards

Evaluation of MACOM system safety programs

Product improvement proposal reviews

Identifies and prioritizes safety PIPs

USASC voting member of PIP review board

The Army System Safety Program

ASA (RDA) interest in system safety

Letter to Commander, AMC, requiring that system safety responsibility be included in PM charters

Letter to Commander, OTEA, requesting a method of incorporating system safety into operational testing

Letter to Commander, TRADOC, requesting ideas on injecting system safety into the combat development process

Problem areas

Program is fragmented along organizational and disciplinary lines

Army has no overall risk management/risk acceptance policy

Testing and evaluation do not address system safety performance

Emphasis on accelerated development and off-the-shelf procurement exacerbate these problems

Defense Systems Management College needs to have system safety expanded from 20 minutes to at least one hour

1985 plans to strengthen the program

Revise AR 385-16

Incorporate risk management/acceptance policy

Define responsibility and required interfaces

Establish automated hazard data base

Facilitate information sharing

Provide cradle-to-grave history

1985 plans to strengthen the program (continued)

Establish interdisciplinary system safety working groups

Institute intensive management procedures for major new systems

System safety as part of MACOM evaluations

Publish system safety guides for project managers and test organizations

Overall evaluation

Ongoing programs and new initiatives along with top-level emphasis will enhance the program

System safety program must be resourced to provide continuous intensive support to accelerated development and off-the-shelf acquisition programs

System safety research must provide innovative approaches to future challenges

PRESIDENT'S 3% REDUCTION GOAL

The Army's goal for meeting the President's 3% reduction goal as augmented by the Secretary of Defense's guidance is divided into two sub-goals, military and civilian. The overall Army goal for FY 84 was 28,494 injuries/illnesses - 17,284 civilian and 11,210 military. The Army exceeded the civilian goal by 3.9% - 679 injuries/illnesses (totals provided by Office of Worker's Compensation) and was below the military goal by 6.8% - 761 injuries/illnesses, resulting in a .3% overall reduction below the FY 84 goal.

- * In FY 84 an Army Plan of Action for accomplishing the President's and Secretary of Defense's 3% reduction goal was developed and implemented by Chief of Staff, Army (CSA) message dated 11 July 1984. The CSA directed that commanders at all levels develop their own action plans that involve safety, occupational health and worker compensation personnel.

The Army Plan requires the following actions:

- a. Installations use the OSHA Form 200 and DA Form 285 data to assess civilian workforce problems and DA Form 285 data to assess military problem areas. The installations enter all OSHA recordable injuries and illnesses and all injuries and illnesses resulting in the submittal of a CA 1 or CA 2 to OWCP on the OSHA Form 200. The DA Form 285 or the CA 1 or CA 2 may be used as the supplemental record for the OSHA Form 200. A DA Form 285 is to be completed and submitted for those civilian and military injuries and illnesses that meet the criteria of AR 385-40. The installation FECA Program Administrator will maintain a compensation case log and will coordinate the entries to this log with the Safety Office and occupational health personnel. The OSHA Form 200, DA Form 285 and Compensation Case Log data are used to target the civilian and military occupational activities which are involved in the majority of accidental injuries and illnesses. Countermeasures are to be developed and implemented to eliminate or reduce those injuries and illnesses in the major occupational activities. The FECA Program Administrator and the Occupational Health Official serve on the Occupational Safety and Health Advisory Council to monitor the implementation and effectiveness of installation action plans. The installations are required to submit a quarterly civilian and military statistical summary with countermeasure information to the MACOM.
- b. MACOMs. The MACOMs use the data and information provided by the installations to verify FECA Table II data and to assess the overall MACOM civilian and military workforce problem areas. Results of this assessment are used to adjust MACOM action plans to target on those problems. The FECA Program Administrator and the Occupational Health Official serve on the MACOM Occupational Safety and Health Advisory Council to monitor the implementation and effectiveness of the MACOM action plan. MACOMs are required to submit a quarterly civilian and military statistical summary with countermeasure information to USASC.
- c. USASC establishes and provides the MACOMs with their baseline and yearly goals, analyzes the quarterly MACOM reports and submits an Army-wide status report to the CSA. USASC provides the MACOMs with a quarterly analysis of FECA claims and DA Form 285 data and disseminates countermeasures and initiatives found to be effective in reducing injuries and illnesses for inclusion in MACOM action plans. The analysis

is presented by occupation, causes of accidents, occupational activities and injuries and illnesses which are involved in the majority of occupational accidents.

For the Army Action Plan to be completely effective, USASC, MACOMs and installations must be able to audit FECA Table II data. This capability did not exist in FY 84 due to nonavailability of tapes, inability to identify installations and unclear tape data elements. Resolution of these problems has been effected by mutual action on the part of all agencies involved and should result in better action plan efforts in the remainder of FY 85. USASC is now receiving monthly and quarterly FECA Table II tapes and entering them into the Army Safety Management Information System (ASMIS). USASC is expanding the ASMIS to provide MACOM and installation access to the FECA Table II data. This will allow the MACOMs and installations to audit the Table II data using the OSHA Form 200 to determine invalid and/or wrongly coded claims. This capability will be in effect 1 April 1985.

Preliminary information indicates that the capability to identify and exclude invalid claims, wrongly coded claims and zero-dollar claims would reduce the Army's new compensation claim totals to far below the 3% goal established for the Army. As displayed by the Fatality Accountability Chart, the Army compensation fatality total was in error by 13 fatalities. This is a reduction of 35% in fatalities. Although unsubstantiated at this time, evaluation of the FY 84 FECA Table II tapes indicates there are approximately 7829 claims that were filed but had not been processed for FY 84 that could result in denied claims or zero-dollar claims.

USASC is working closely with the Civilian Personnel Directorate of the ODCS PER at HQDA in their efforts to perform social security number checks, establish special medical programs, and job restructuring to permit light-duty work to reduce the incidence of new compensation claims.

The Army safety belt use policy contained in AR 190-5 requires Army installation traffic codes to mandate: the wearing of vehicle restraint systems by operators and passengers of US Government vehicles when such equipment is required by law or regulation, and the wearing of restraint systems by all military and civilians driving or riding in a POV on Army installations if such equipment is required by law or regulation. A current revision of AR 190-5 will contain mandatory vehicle restraint system provisions for all personnel and traffic point assessment for each violation. The Army's driving under the influence (DUI) of alcohol prevention efforts include awareness campaigns such as a 1984-85 Christmas/New Year holiday campaign designed around the Presidential Commission's report on drunk driving, participation of Army law enforcement personnel in the DOD intoxicated driving prevention task force, and adoption of intoxicated driver countermeasures similar to those of private sector police agencies which include vehicle inspections, check points, etc., which have been fielded in Circular 19-125, Driving While Intoxicated Countermeasures, April 1984. The Army has instituted awareness campaigns for drunk driving and the wearing of vehicle restraint systems emphasizing strict enforcement and tough penalties. Military Police have been made aware of, and acquainted with, the Improved Sobriety Testing Techniques (ISTT) which are supported by the National Highway Traffic Safety Administration to better recognize signs of alcohol impaired drivers. Tough penalties now contained in AR 190-5 concerning DUI include a general officer reprimand letter and suspension of post driving privileges for one year upon conviction, enrollment in the Army's Alcohol and Drug Addiction Prevention Control Program (ADAPCP) upon apprehension, and administrative reviews of service records of drunk drivers. Enforcement methods to assure usage of vehicle restraint systems currently include gate checks, traffic stops, safety check points, and traffic points which are given to violators at numerous Army installations. The Army does not maintain statistical data on vehicle restraint system usage.

DWI

<u>MONTH - YEAR</u>	<u>CY</u>	<u>CONUS</u>	<u>OVERSEAS</u>	<u>ARMYWIDE</u>	<u>MONTH - YEAR</u>	<u>CONUS</u>	<u>FY</u>	<u>OVERSEAS</u>	<u>ARMYWIDE</u>
JAN 83	841	324	1,165	OCT 83	1,182	567	1,749		
FEB	873	303	1,176	NOV	1,063	494	1,557		
MAR	1,235	407	1,642	DEC	1,158	575	1,733		
APR	1,113	513	1,626	JAN 84	1,109	504	1,613		
MAY	1,091	592	1,683	FEB	1,136	430	1,566		
JUN	1,060	545	1,605	MAR	1,223	580	1,803		
JUL	1,158	551	1,709	APR	1,194	483	1,677		
AUG	1,125	462	1,587	MAY	1,077	461	1,538		
SEP	1,169	490	1,659	JUN	968	492	1,460		
OCT	1,182	567	1,749	JUL	1,078	425	1,503		
NOV	1,063	494	1,557	AUG	1,112	517	1,629		
DEC	1,158	575	1,733	SEP	1,089	454	1,543		
CY 1983	13,068	5,823	18,891	FY 1984	13,389	5,982	19,371		

DRUNK DRIVING APPREHENSIONS

	CONUS	Overseas	Armywide	On-Post	Off-Post
1st Qtr, CY 83	2,949	1,034	3,983	1,757	2,226
1st Qtr, CY 84	3,468	1,514	4,982	1,994	2,988
2d Qtr, CY 83	3,264	1,650	4,914	1,912	3,002
2d Qtr, CY 84	3,239	1,436	4,675	1,889	2,786
3d Qtr, CY 83	3,452	1,503	4,955	2,005	2,950
3d Qtr, CY 84	3,279	1,396	4,675	1,867	2,808
Jan-Sep 1983	9,665	4,187	13,852	5,674	8,178
Jan-Sep 1984	9,986	4,346	14,332	5,750	8,582

Percent of
Increase/Decrease

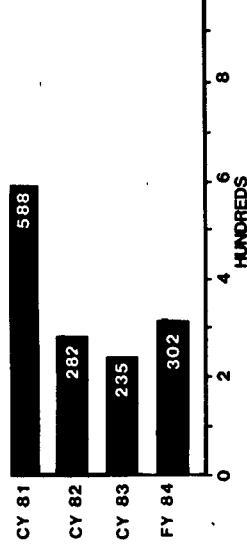
3d Qtr, CY 83 compared to 3d Qtr, CY 84	-5.0%	-7.1%	-5.7%	-6.9%	-4.8%
Jan-Sep 1983 to Jan-Sep 1984	+3.3%	+3.8%	+3.5%	+1.3%	+4.9%

Source: DA Form 2819

SAFETY AND OCCUPATIONAL HEALTH TRAINING PROGRAM

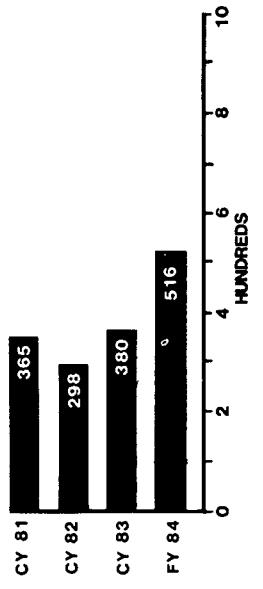
(Total Numbers of Personnel Trained)

AVIATION SAFETY TRAINING

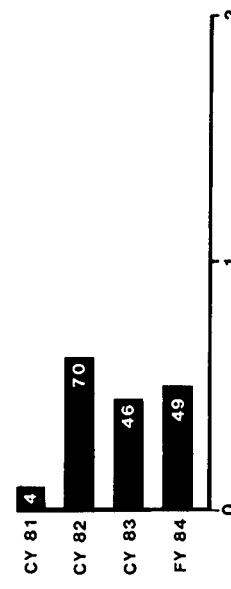


This training consisted of resident and mobile instruction in the Aviation Safety Officer Aviation Accident Prevention and Aviation Safety Officer Refresher courses provided by USASC. The Accident Prevention Course has been attended by some collateral duty personnel when space has been available.

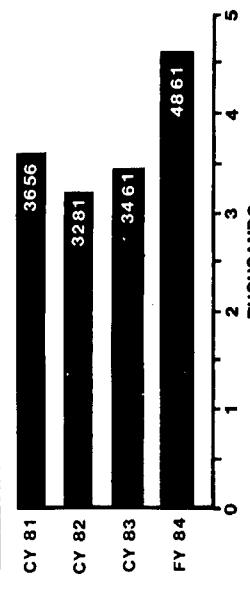
NON-AVIATION SAFETY TRAINING



OSHA TRAINING



SAFETY MANAGEMENT



This training consisted of resident and mobile instruction in the following USASC courses:

- Fundamentals of Army Accident Prevention
- Army Safety Program Management
- Range Safety
- Risk Management for Commanders
- Risk Management for Safety Managers
- Army Accident Investigation

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This training was accomplished by enrollment in the non-resident "OSHA Compliance Management" course administered by USASC. It is available to military and civilian collateral duty SOH personnel as well as safety careerists. Total enrolled as of 30 Sep 84 was 348. Of the 169 personnel who completed the OSHA course, 108 were civilians.

The Unit Accident Prevention Course was the primary tool used to train 56 unit SOH personnel in CY 81.

To provide this training to more personnel, it was made into an exportable package. It is unknown how many persons were trained using this package. In

FY 84, TRADOC hosted a work group to update the

course. USASC will field the revised course in FY

85. Three correspondence courses are also available.

FY 85 EDUCATION AND TRAINING COUNTERMEASURE OBJECTIVES

1. Develop the Commander's Accident Prevention Plan, focusing on accident prevention in ground units.
2. Revise the military and civilian safety education structure.
3. Develop the Aviation Safety Officer and the Aviation Safety Officer Refresher Correspondence Courses to support the National Guard and Reserve Components.
4. Establish a Centralized Safety Intern Training Program for all US Army Safety Interns (less Corps of Engineers and Army Materiel Command).
5. Develop the Unit Safety Officer Course to be taught by installation safety managers to all additional duty safety officers and noncommissioned officers.
6. Revise the Aviation Safety Officer Handbook.

During FY 84 the Army Safety Center also:

- Established an explosive safety course. The initial course was presented to users and safety personnel assigned to units in the Eighth US Army Korea. Four courses are scheduled for FY 85.
- Updated twelve safety education programs of instruction (POI).
- Presented sixteen safety briefings to National Guard personnel.
- Conducted 9 safety briefings at Aviation Stand Downs at active Army installations.
- Fielded the 10th Edition Guide to Aviation Resources Management for Aircraft Mishap Prevention.

US Army National Guard:

- Established a policy requiring appointment orders for a full-time unit support person to serve as the assistant to unit safety officers to enhance unit safety and occupational health training.
- Is currently developing a Program of Instruction (POI) for collateral duty safety officers/noncommissioned officers to be fielded during 3d quarter 1985.

US Army Reserve:

- Conducted a 1-day training course for safety managers at the MUSARC Level1.
- Is currently developing SOH training programs for MUSARC Level.

SAFETY PERSONNEL STAFFING

	<u>FULL TIME</u>	<u>MILITARY</u>	<u>CIVILIAN</u>	<u>FOREIGN NATIONAL</u>
GS-018 Safety Manager/Specialist		510		125
GS-803/801 Safety Engineer		196		
Aviation Safety Officers	403	403	19	
GS-019 Safety Technician		26		
National Guard			56	
GS-018 Safety Manager / Specialist				
TOTAL	403	807	125	
<hr/>				
	<u>PART TIME</u>	<u>MILITARY</u>	<u>CIVILIAN</u>	
Active Army Unit		Unknown	Unknown	
Collateral Duty Safety Officers				
National Guard		235	None	
Aviation Officers				
US Army Reserve		88	None	
Aviation Safety Officers				
US Army Reserve		30	None	
Safety & Occupational Health Personnel				
TOTAL		353		

SIGNIFICANT ORGANIZATIONAL CHANGES

There have been no significant organizational changes effective during the reporting period.

RAC 1 AND 2 OSH HAZARDS ABATEMENT

FUNDS PROVIDED BY PDIP 1S61 (MILLIONS)

	FY 80	FY 81	FY 82	FY 83	FY 84	TOTAL
OMA	\$21.3	\$26.3	\$33.4	\$30.2	\$28.4	\$139.6
MCA	\$	\$	\$11.9	\$15.3	\$19.8	\$ 47.0
TOTAL	\$21.3	\$26.3	\$45.3	\$45.5	\$48.2	\$186.6

FUNDS SPENT FY 80 - FY 84 (MILLIONS)

	ALLOCATED	SPENT
OMA	\$139.6	\$174.8
MCA	\$ 47.0	\$ 47.0
TOTAL	\$186.6	\$221.8

FUNDS RESOURCED FOR FY 84 (MILLIONS)

	ALLOCATED	SPENT
OMA	\$28.4	\$33.5
MCA	\$19.8	\$19.8
TOTAL	\$48.2	\$53.3

The "fenced funds" for the correction of RAC 1 and RAC 2 OSH deficiencies ended in FY 84. OSH projects must now compete with all other projects for funding. Policy and guidance was issued through the Army Program Budget Guidance for the MACOMs to continue to identify RAC 1 and RAC 2 OSH deficiencies and to program for the correction of these deficiencies through the standard OMA and MCA funding channels on a worst-first basis. MACOMs have established procedures in their abatement plans for the submittal of projects and to monitor the correction of OSH deficiencies. The effectiveness of, and adherence to, these procedures is examined during MACOM program evaluations. A new PDIP to provide special funds for the correction of OSH deficiencies is being developed for insertion in the FY 87-FY 91 budget cycle.

EXPLOSIVES HAZARDS ABATEMENT

FUNDS PROVIDED BY PDIP 1S3Y (Millions)					
	FY86	FY87	FY88	FY89	TOTAL
OMA	\$10.0		\$ 3.0	\$14.0	\$27.0

The US Army Safety Center (USASC) has developed and implemented an Army data bank on existing Army-wide waivers to explosives safety standards. Information provided by this computerized program is being used to develop a PDIP for the FY87-91 budget cycle. Waivers are evaluated and funding requested on a worst-first case.

Actions Taken to Strengthen SOH Programs of the Reserve Components

US Army National Guard:

- Established Safety and Occupational Health Advisory Committee (SHAC) at Army Directorate (NGB) level for -- Policy decisions affecting SOH issues.
- Assignment of 1 occupational health nurse in each state.
- Fielded a policy to the states requiring the appointment of 1 full-time unit support person to serve as the assistant to the unit safety officer intended to improve unit safety programs.
- Developed and fielded a FY 84 SOH countermeasure multi-media program titled -- Operation Safe-Guard IV targeted at reducing personal injuries by 10%.
- Revised NGR 385-10, the NG Safety Program which includes medical surveillance program requirements.
- Conducted 10-day OSH courses for 53 State Safety Managers.
- Increased attendance of NGB personnel in Army Safety & Occupational Health Courses.
- Developing a POI for NGB personnel to improve the quality of accident prevention/investigation and reporting.
- Conducted 8 SOH training courses for selected ARNG personnel in the CONUS.

Actions Taken to Strengthen SOH Programs of the Reserve Components (Cont'd)

US Army Reserve:

- Increased attendance of US Army Reserve personnel in Army Safety & Occupational Health Courses.
- Developing SOH training programs.
- Published CONUSA Reg 385-1 and Pam 385-1.
- Issued safety alerts and information bulletins.
- Published a quarterly summary of selected accidents with attendant countermeasures.
- Upgraded indoor rifle ranges.
- Conducted pre-holiday safety presentations.
- Issued monthly command advisories concerning safety evaluations of twelve MUSARC's.

ARMY SAFETY GOALS

1. Achieve Presidential mandated cumulative 3% annual reductions in civilian and military occupational injuries and illnesses in FY 1985 and in program outyears. (Note: Civilian reductions and goal accomplishment shall be based on workers compensation claims rather than DA Form 285, Accident Report, statistics.)
2. Initiate appropriate prevention controls to reduce FY 1985 aviation class A-C mishaps by 10% and Army motor vehicle accidents by 5% of the most recent three year average (FY 1982-84).
3. Assure that materiel failures or system shortcomings are appropriately identified in accident reports and that requisite Equipment Improvement Recommendations and Quality Deficiency Reports (EIR/QDR) are submitted to commodity commanders and material work orders are issued with expedited abatement schedules for correction of Category I safety deficiencies.

OCCUPATIONAL HEALTH

DEPARTMENT OF THE ARMY OCCUPATIONAL HEALTH OBJECTIVES - 1984

Conduct Occupational Health Program Management
Evaluations At All Levels Of The Army

This objective is ongoing. Fifty-nine program evaluations were conducted by the US Army Environmental Hygiene Agency. These included overall evaluations as well as specific program assessments such as Industrial Hygiene, Hearing Conservation, Occupational Vision and Occupational Medicine. Additionally, approximately thirty Occupational Health liaison visits were conducted by the Office of The Surgeon General, Health Services Command and Army Materiel Command.

CONTINUE IMPLEMENTATION OF OCCUPATIONAL HEALTH PROGRAMS
AT OVERSEAS ARMY INSTALLATIONS

The US Army Europe received an Office of The Surgeon General Occupational Health staff visit to emphasize the importance of establishing an effective program in Europe. This was reinforced by the provision of forty personnel spaces.

The US Army Japan established an automated health hazard inventory system with the anticipation of progressing to an automated medical surveillance program.

The US Army Pacific Environmental Health Engineering Agency initiated a program to establish a baseline health hazard inventory for Eighth US Army (Korea).

EMPHASIZE THE OCCUPATIONAL HEALTH PROGRAM
FOR ACTIVE DUTY MILITARY

This objective is ongoing. The Basic Course for Preventive Medicine Officers now includes additional instruction in the Occupational Health Program. Studies are currently underway at Fort Campbell to better define the occupational health requirements of the active duty soldier. Methods of preventing lower extremity injuries during training are being evaluated at two MEDDAC's with impressive results. Special emphasis has been placed on the acquisition and use of personal protective devices by soldiers. Greater coordination between hospital and division medical personnel has been successful in integrating occupational health services into the lowest echelon of active duty health care.

DEVELOP A MODEL OCCUPATIONAL HEALTH PROGRAM AT A MAJOR
INDUSTRIAL INSTALLATION AND A EUROPEAN MEDDAC

Fort Campbell has been designated the Model Installation Occupational Health Program and staffed fully to the recognized personnel requirements.

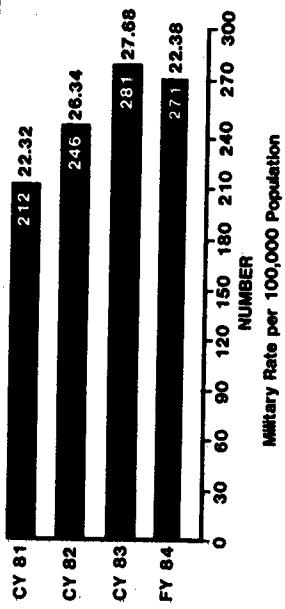
The Program Is Designed To:

- Determine occupational health program requirements based on installation specific needs
- Develop new occupational health care delivery strategies designed to minimize non-productive employee time
- Field test new occupational health initiatives
- Evaluate the application of health hazard assessment principles in the operational setting

The designation of a European Model Installation Occupational Health Program has been delayed while a major command-wide study is being conducted to more clearly define the Army's responsibility to provide occupational health services to local national and third country employees

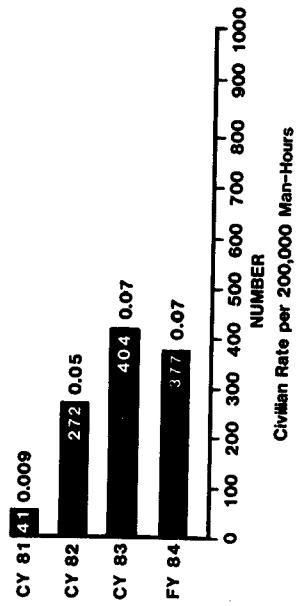
U.S. ARMY OCCUPATIONAL ILLNESSES

MILITARY



Military occupational illnesses decreased by 4% (-10 occupational illnesses) in FY 84 compared to CY 83. This resulted primarily from a decrease in disorders such as heatstroke, heat exhaustion, sunstroke, and other effects of environmental temperature extremes. Four fewer fatalities (5 in CY 83 compared to 1 in FY 84) occurred as a result of occupational illnesses.

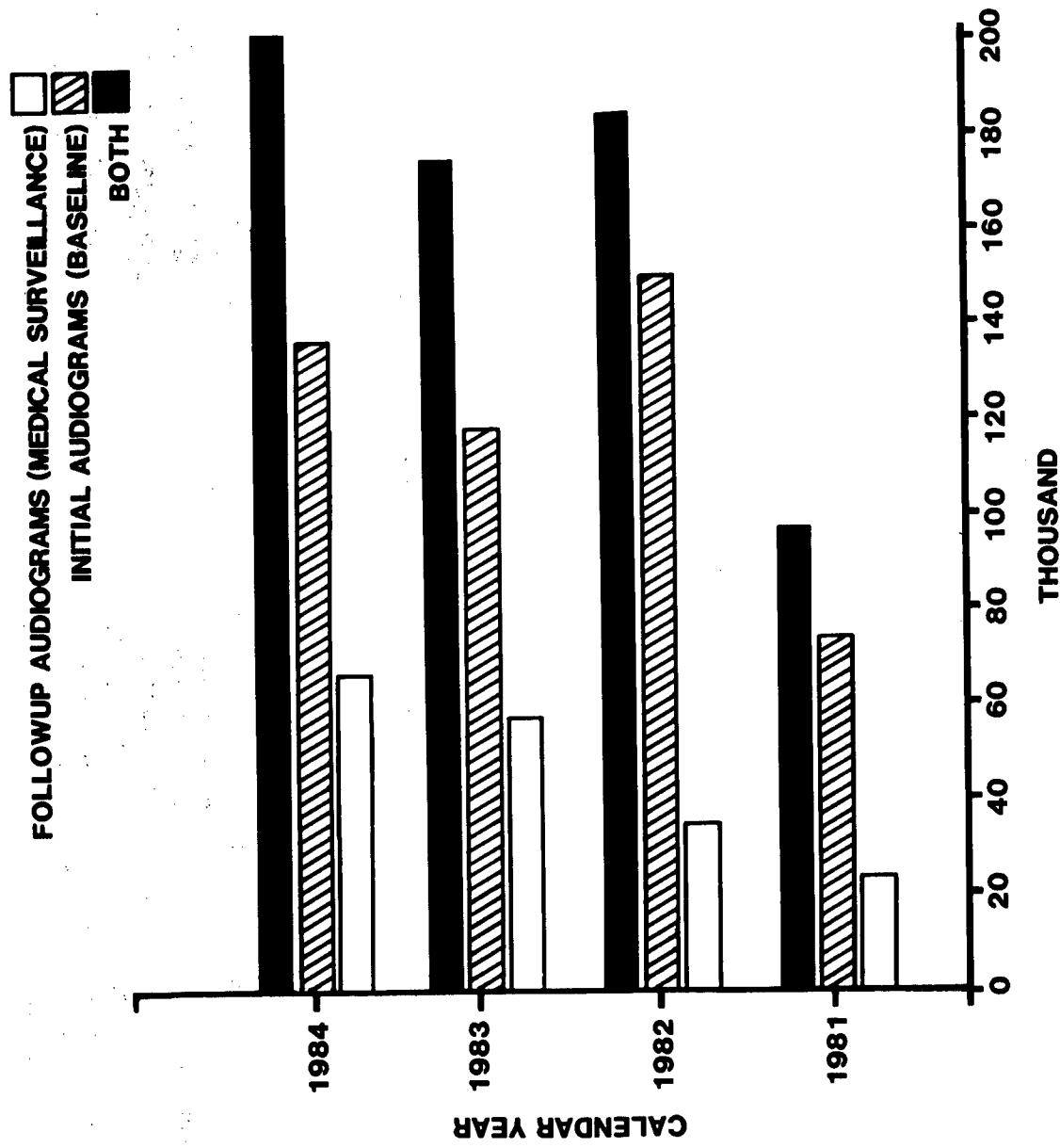
CIVILIAN



Civilian occupational illnesses decreased by 7 percent (-27 illnesses) in FY 84 compared to CY 83. This is a result of fewer respiratory conditions due to toxic agents (ammonia and disinfectant fumes, sulfur and carbon monoxide fumes and smoke).



HEARING CONSERVATION FORMS RECEIVED AT USAEEHA BY CALENDAR YEAR



SPECIAL INTEREST ITEMS

- Occupational Health Staffing
- Additional Personnel Authorized by PDIP 6T4P
- Significant Personnel Changes in the Reserve Forces
- Health Hazard Assessment
- Occupational Health Management Information System
- Support to the Reserve Forces

OCCUPATIONAL HEALTH STAFFING - 1984

	Occupation		Full-time			Part-time		
			Military	Civilian	Foreign Nationals	Military	Civilian	Foreign Nationals
Occupation	Occupational health physicians		20	36	0			
	Occupational health nurses		1	224	3			
	Industrial hygienists		45	135	4			
	Health physicists		71	54	0			
	Technicians		60	66	12			
	Others		47	46	10			
	SUB TOTAL		244	561	29			
<hr/>								
Occupation	Occupational health physicians		250	30	0			
	Occupational health nurses		25	0	0			
	Industrial hygienists		95	0	0			
	Health physicists		16	50	0			
	Technicians		300	21	0			
	Others		20	55	2			
	SUB TOTAL		706	156	2			
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	TOTAL		950	717	31			

ADDITIONAL PERSONNEL AUTHORIZED BY PDIP 6T4P

One hundred and eighty-five civilian authorizations were provided under PDIP 6T4P in support of the Occupational Health Program. One hundred and forty-five were provided to the US Army Health Services Command and forty to US Army Europe. Over eighty-three percent of these spaces were placed in direct support positions at installations in CONUS and Europe with the remainder going to the consulting or backup activities -- US Army Environmental Hygiene Agency and the 10th Medical Laboratory. Despite the difficult task of recruiting these highly skilled and scarce personnel resources, eighty-four percent of the positions are filled with active recruitment in process for the remaining. This personnel increase has been the largest single action in the history of the Army Occupational Health Program that will allow significant improvements and advancements; however, manpower appraisals are identifying additional requirements that are needed to fully implement a comprehensive program.

SIGNIFICANT CHANGES IN RESERVE FORCES PERSONNEL

A National Guard position for a full time occupational health nurse/technician was established in each state effective 31 January 1984. To date, thirty-eight of the positions are filled and active recruitment is in process for the remainder.

HEALTH HAZARD ASSESSMENT

The Army Medical Department is extensively involved in health hazard assessments of materiel and equipment IAW AR 40-10. Close coordination is effected with the various program managers and developers to ensure that potential health hazards are identified in the initial life-cycle stages so that expensive retrofits or modifications are not required after the materiel or equipment is fielded. The AMEDD position is definitely one of support and not one of blocking. During fiscal year 84, sixty-three requests for health hazard assessments were received with forty-eight being completed. Examples of the impact of health hazard assessments on selected US Army weapon systems, components or equipment are depicted below.

XM 40 Protective Mask - Resulted in a revised specification for skin sensitivity testing and stringent testing to determine levels of hexavalent chromium (a known carcinogen) bleeding through the C2 canister.

M1E1 Tank - Resulted in research to assess crew operations in MOPP over extended periods because of heat stress and reemphasized danger of shutting off the ventilation system with the engine running.

XM 4 107 mm Practice (4.2") Training Device - Resulted in efforts to replace the cadmium oxide in the smoke marker in the round to a less toxic substance such as zinc oxide.

XM 819, Cartridge, 81 mm, R P Screening Smoke - Resulted in recommendations to characterize combustion products to assess chronic health hazards (if any).

PATRIOT - Resulted in recommendations to incorporate engineering controls or procedures to preclude exposure to non-ionizing radiation on the radar roof set.

AT 4 Anti Armor Weapon System - Resulted in further testing to measure impulse noise levels when fired from other than standing positions.

OCCUPATIONAL HEALTH MANAGEMENT INFORMATION SYSTEM
(OHMIS)

OHMIS has received priority treatment in an attempt to provide a workable system to the field as soon as possible. The original complexion has changed significantly and evolved into a modular concept with the modules being prototyped and fielded as development allows. The Deputy for Environment, Safety and Occupational Health, OASA (I&L), has included the fielding of the Health Hazard Inventory and Hearing Evaluation Automated Registry System OHMIS modules in the Goals for FY 85. This significantly enhanced the status of OHMIS and has allowed additional action to be accomplished with a minimum of delays. A formal Inprocess Review is scheduled for second quarter FY 85.

SUPPORT TO THE RESERVE FORCES

Army National Guard. A total of 62 surveys were performed under the auspices of the US Army Environmental Hygiene Agency during FY 84. This included industrial hygiene (program evaluations, hazard identification and special studies), Hearing Conservation and Occupational Medicine surveys. Approximately 67 surveys are programmed for FY 85 with 12 being completed to date. The MEDCEN/MEDDAC have provided 12 various types of occupational health assistance services. Additionally, specific contract services were undertaken to support the National Guard.

Army Reserve. During FY 84 approximately 40 occupational health surveys/services were provided by the MEDCEN/MEDDAC to USAR locations/activities that are not co-terminus with an active duty installation. All USAR activities that are on active duty installations receive direct occupational health support as does other installation tenants. Also, specific contract services were undertaken to support the Army Reserve with emphasis given to evaluations of indoor firing ranges.

DEPARTMENT OF THE ARMY OCCUPATIONAL HEALTH OBJECTIVES - 1985

- Provide medical service in support of the presidential mandated cumulative 3% annual reductions in civilian and military occupational injuries and illnesses in FY 1985 and in program outyears
- Update the local occupational health hazard inventory (LOHHI) data in the format consistent with the health hazard inventory module of the occupational health management information system (OHMIS)
- Procure and field the equipment associated with the automation of the health hazard inventory (HHI) module of OHMIS
- Place in operation the hearing evaluation automated registry system (HEARS) module of OHMIS
- Provide occupational health services for military personnel comparable to those available to their Army civilian counterparts.

FIRE

PROGRAM OBJECTIVES AND GOALS

FY 84

Publication of revised AR 420-90, "Fire Protection," implementing sweeping changes mandated by DODI 6055.6, "DOD Fire Protection Program."

This objective achieved. AR 420-90, effective 1 Feb 1985, requires preparation of Annual Work Plan; use of new manpower standards (MS-3); new training, fire prevention, and fire protection engineering standards; provides DA format for new fire protection operational readiness inspections; and recommends a firefighter job related physical fitness program.

Implement new DOD Fire Incident Reporting Manual, DOD 6055.7-M. This reporting system will enable DOD Fire Protection Committee Members (Army, Navy, Air Force and Marines) to identify common problems and launch coordinated corrective actions.

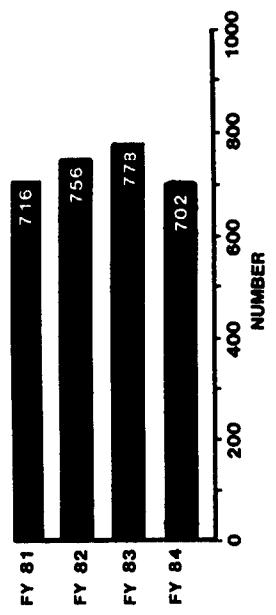
This objective achieved. Army implemented DOD fire reporting system on 1 Oct 1984. DOD reports (DD 2324 and 2324-1) sent to the Naval Safety Center in Norfolk, Virginia for automation. OCE/MACOMS will receive 30 separate statistical analyses for 1st quarter FY 85 in late March 1985. Army reportable fires and corresponding dollar losses will increase due to lower reporting threshold of \$1 vs \$250 previously used by the Army.

Assist the US Army Safety Center in developing countermeasures to attack the recurring high fire frequency in family quarters and high fire losses in tracked vehicles.

This objective was partially achieved and will be an ongoing initiative. OCE provided USASC tracked vehicle and family quarters fire data analyses for FY 83. Although tracked vehicle losses dropped 45%, family quarters losses increased by 15%. USASC/AMC/OCE are exploring new fire extinguishing agents to improve tracked vehicle fire containment. New DA family quarters fire policy requires family sponsors/dependents attend a fire prevention orientation during the mandatory self-help orientation briefing, fire inspection of quarters during change of occupancy and smoke detector inspection by preventive maintenance or assignments and termination teams. Serious tracked vehicle and family quarters fires are published in the bi-monthly OCE Items of Interest Bulletin to all facilities engineers. Fact sheet on tracked vehicle also presented at the 6th Worldwide Engineer Conference held last November in Philadelphia.

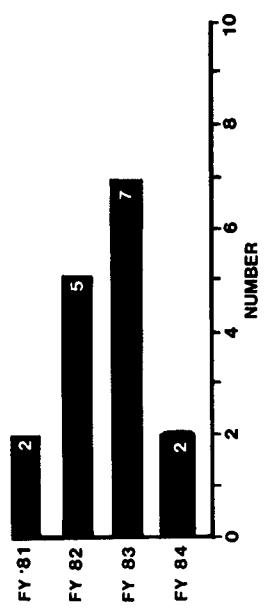
ARMY FIRE LOSSES

FIRE



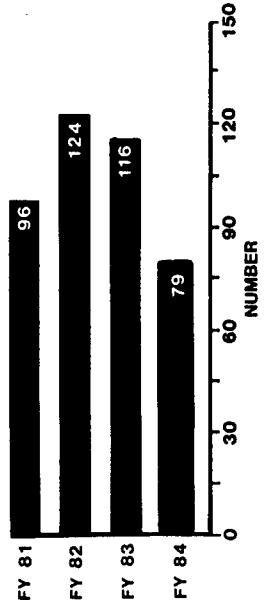
The upward trend in number of fires was reversed in FY 82 and fell 10% from FY 83 to FY 84. Most fires occurred in residential occupancies (42%) which was about the same as FY 83 (41%). Primary fire causes continue to be careless smoking, unattended cooking and children playing with matches/lighters. The 4-year average is 738 fires.

FATALITIES



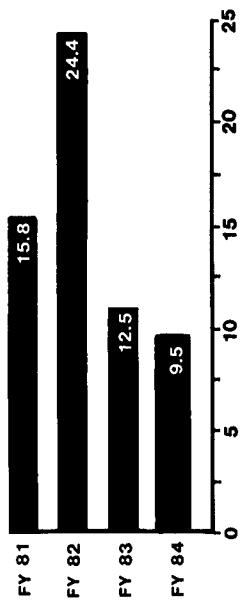
The sharp upward trend in fire fatalities was reversed in FY 83 and decreased 71% in FY 84. A 60% drop in family quarters fires was the primary cause. The only 2 fatalities in FY 84 were 3-year-old twin girls who started the fire while playing with a lighter. A smoke detector actuated but the mother was not able to rescue the children. The 4-year average is 4 fatalities.

NON-FATAL INJURIES



A significant downward trend in fire injuries continued in FY 84 with a 32% decrease (37 injuries) from FY 83. Residential occupancies accounted for 46% of injuries in FY 84. The 4-year average is 103.8 injuries.

TOTAL COST



Army property losses also dropped significantly decreasing 24% (\$3.0M) from FY 83. Tracked vehicles and public assembly losses dropped 45% and 72% respectively from FY 83 and were main causes of improved fire statistics. The 4-year average loss is \$15.6M.

Army Fire Losses FY 83

OCCUPANCY	NO. OF FIRES	\$ LOSS	INJURIES	FATALITIES
1. Family Quarters (Rent-Free)	226	1,660,703	32	5
2. Wheeled Vehicles	160	673,703	16	0
3. BEQ's, BCQ's, BK's	65	485,395	3	0
4. Industrial	51	1,931,996	12	0
5. Public Assembly	44	1,953,645	4	0
6. Tracked Vehicles	43	2,870,610	3	0
7. Grass/Forest	42	383,264	12	0
8. Tent	28	95,081	8	1
9. Family Quarters (Leased)	26	282,680	3	1
10. Miscellaneous	26	119,417	1	0
11. Warehouse Storage	22	817,589	3	0
12. Admin Office	21	905,586	5	0
13. Schools	8	99,420	0	0
14. Health Care Facilities	7	23,089	0	0
15. Vacant Structure	5	130,169	14	0
16. Aircraft Hangars	2	14,110	0	0
17. Family Quarters (Mobile Homes)	2	8,531	0	0
	778	12,484,988	116	7

ARMY FIRE LOSSES

FY 84

		No. of Fires	\$ Loss	Injuries	Fatalities
1.	Family Quarters (Rent-Free)	223	1,749,052	35	2
2.	Wheeled Vehicles	130	753,019	7	0
3.	Grass/Forest	62	524,756	5	0
4.	Industrial	46	1,768,270	9	0
5.	BOQ's, BOQ's, BK's	44	105,606	0	0
6.	Public Assembly	35	509,373	0	0
7.	Warehouse Storage	27	1,264,676	5	0
8.	Tent	26	109,571	5	0
9.	Admin Office	25	365,033	0	0
10.	Tracked Vehicles	24	1,354,397	7	0
11.	Family Quarters (Leased)	21	88,863	1	0
12.	Miscellaneous	20	71,207	4	0
13.	Schools	5	57,216	0	0
14.	Vacant Structure	5	50,280	1	0
15.	Health Care Facilities	4	32,596	0	0
16.	Family Quarters (Mobile Homes)	4	0	0	0
17.	Aircraft Hangars	1	650,000	0	0
TOTAL		702	9,454,815	79	2

FIRE PROTECTION STAFFING

OCCUPATION	FULL-TIME			PART-TIME		
	MILITARY	CIVILIAN	FOREIGN NATIONALS	MILITARY	CIVILIAN	FOREIGN NATIONALS
Fire Prevention Engineers	0	7	1		80	362
Fire Protection Specialists	0	6	10		0	0
Fire Fighters	365	3,064	1,305		0	0
TOTAL	365	3,077	1,316	80	362	0

FY 85 OBJECTIVES

Publish a technical evaluation report on a newly developed, low cost, fast response sprinkler system to be installed in Building 48, Bachelor Officers Quarters, Ft Myer, Virginia.

Continue assisting the US Army Safety Center in developing countermeasure to reduce the frequency/severity of tracked vehicle fires to include examining the effectiveness of Halon 1211, 1301 and 2402 extinguishing agents.

Publish the first Army fire loss report using the DOD fire reporting system. Fire data base will contain much more data (because of lower reporting threshold) and will enable a detailed analysis of Army/DOD fire problems.

Conduct the first Army Fire Chiefs Training Session under the auspices of the Federal/Military Section of the International Association of Fire Chiefs. Topics will include Army's installation of the first fast response sprinkler system in the DOD, Sesame Street's Fire Safety Program at Ft Polk and Ft Carson, and the United States Fire Administration Train-The-Trainer Program on "Fire Service Supervision."

Publish serious fire loss incidents and countermeasures in the bi-monthly OCE Engineer Items of Interest Bulletin and participate in various OCE sponsored courses promoting fire protection.